



ESPAS, the near-Earth space data infrastructure for e-
Science

User's Manual

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Project Information

Project acronym: ESPAS
 Project full title: Near-Earth Space Data Infrastructure for e-Science
 Project coordinator: Prof. Mike Hapgood
 Project web site(s): <http://www.espas-fp7.eu/>

Consortium

Beneficiary number	Beneficiary name	Beneficiary short name	Country	Project entry month	Project exit month
1 (Coordinator)	SCIENCE AND TECHNOLOGY FACILITIES COUNCIL	STFC	United Kingdom	1	42
2	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS	NKUA	Greece	1	42
3	EISCAT SCIENTIFIC ASSOCIATION	EISCAT	Sweden	1	42
4	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	DLR	Germany	1	42
5	ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA	INGV	Italy	1	42
6	WATERMANN JUERGEN FRIEDRICH WILHELM	JFWCONSULT	France	1	42
7	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	CNRS-IPAG	France	1	42
8	ATHENA RESEARCH AND INNOVATION CENTER IN INFORMATION COMMUNICATION & KNOWLEDGE TECHNOLOGIES	ATHENA RC	Greece	1	42
9	OULUN YLIOPISTO	uOulu	Finland	1	42
10	UNIVERSITY COLLEGE LONDON	UCL	United Kingdom	1	42
11	MET OFFICE	MO	United Kingdom	1	42
12	THE UNIVERSITY OF BIRMINGHAM	UB	United Kingdom	1	42
13	INSTITUT D'AERONOMIE SPATIALE DE BELGIQUE	IASB	Belgium	1	42
14	CENTRUM BADAN KOSMICZNYCH POLSKIEJ AKADEMII NAUK	SRC PAS	Poland	1	42
15	DANMARKS TEKNISKE UNIVERSITET	DTU	Denmark	1	42
16	UNIVERSITETET I TROMSOE	UIT	Norway	1	42
17	ILMATIETEEN LAITOS	IL	Finland	1	42
18	UNIVERSITY OF LEICESTER	ULEIC	United Kingdom	1	42
19	Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum	GFZ	Germany	1	42
20	KONINKLIJKE STERRENWACHT VAN BELGIE	ORB	Belgium	1	42
21	DH CONSULTANCY BVBA	DH CONSULTANCY	Belgium	1	42
22	LOWELL DIGISONDE INTERNATIONAL LLC	LDI	United States	1	42

Summary

This document is the User's Manual of ESPAS portal. It presents a detailed description of the ESPAS portal and its functionalities with examples and screen shots for the regular user.

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1. ESPAS Portal

The ESPAS Portal has been developed in the framework of the ESPAS project (<http://www.espas-fp7.eu/>) and is available at:

<https://www.espas-fp7.eu/portal/index.html>

ESPAS is a data e-infrastructure facilitating access to observations and model predictions of the near-Earth space environment, a region extending from the Earth's atmosphere up to the outer radiation belts. Through the ESPAS portal the user has access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors. The user can perform searches for observations using specific criteria (e.g. time, instrument) and download data files or data values.

More precisely, the ESPAS portal provides the following services to the user:

- **Metadata search** for observations that satisfy the following specific criteria:
 - Time period: the time period when the observations were acquired
 - Assets: the Instruments and Models that were used for the generation of the observations
 - Observed properties: the observed properties that were measured in the observations
 - Observation collections: the collections that the observations belong to
 - Location: the location of the platforms (ground-based observatories or satellites) on which the instruments are mounted and used for the generation of the observations
- The metadata search is open to all users with no registration required.
- **Data access:** The result of a metadata search is a list of the observation collections (that contain the observations) that satisfy the query criteria. The user has access to the data through the options described below. Note that user registration and login to ESPAS portal is required for this service.
 - **Download of data files** provided by the ESPAS data providers.
 - **Download of data values:** A subset of the observed properties is available for download as extracted data values. After a data value download request, the user gets as a result a text file (in Ascii or XML format) that contains the values of the selected observed properties.
 - Plot of the data values: After a data value download request, the user can view or download the plot that presents the values of the selected observed properties.

All the data and metadata available through the ESPAS portal are provided by the ESPAS Data Providers. The ESPAS Data Providers are special users of the ESPAS portal that have some added functionalities comparing to the simple user of ESPAS (e.g. register

ESPAS User's Manual

data).

This manual presents a description of the ESPAS portal and its functionalities with examples and screen shots for the regular user.

1.1 Home page

The home page of the ESPAS Portal is presented below and consists of the following areas:

The screenshot shows the ESPAS homepage with various sections and links highlighted by red numbers:

- 1** Top right menu: LOG IN | REGISTER | ESPAS Project | Contact Us
- 2** Main menu: HOME | SEARCH | BROWSE | ESPAS POLICIES | VALUE ADDED SERVICES | SUPPORT
- 3** Services overview: ESPAS provides the following services:
 - 1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
 - 2. Download of Data Files
 - 3. Download of extracted parameters
 - o Plots of extracted parameters
- 4** Search and Download: Search and Download observations, collections, files or data from a large number of data providers
- 5** Register: Register your data in ESPAS
- 6** News / Announcements: News / Announcements
 - The ESPAS Training School will be held in Warsaw from 19th to 23rd October 2015. See <http://www.espas-fp7.eu/school> for further details.
- 7** About ESPAS: ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.
- 8** Bottom menu: NEWS | EVENTS | PARTNERS | DATA PROVIDERS

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

1. Top right menu: provides the links for the “Login”/“Sign Out”, “Registration”, “ESPAS project” and “Contact” page.
2. Main menu: provides the links for the “Search”, “Browse”, “ESPAS Policies”, “Value Added Services”, “Support” and “My Account” pages (the “My Account” page is available after login).
3. An overview of the ESPAS services.
4. A link to the main “Search and Download” page.
5. A link to the “Manage Data Source” page (for the ESPAS Data Providers) or a link to Support → “For Data Providers” page (for the simple users).
6. News and announcements area.
7. A brief description of the ESPAS portal.
8. Bottom menu: provides links for the “News”, “Events”, “Partners” and “Data Providers” pages of ESPAS project website.

1.2 Register (user)

In order to register to ESPAS portal, please follow the next steps:

1. Click the **REGISTER** link in the top right menu bar.

The screenshot shows the ESPAS homepage with a red box highlighting the 'REGISTER' link in the top right menu bar. The page includes sections for services, news, and links to partners and data providers.

Top Navigation: LOG IN | REGISTER (highlighted with a red box) | ESPAS Project | Contact Us

Services Section: near earth space data infrastructure for e-science

Menu Bar: HOME | SEARCH | BROWSE | ESPAS POLICIES | VALUE ADDED SERVICES | SUPPORT

Services Overview: ESPAS provides the following services:

- 1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
- 2. Download of Data Files
- 3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download: observations, collections, files or data from a large number of data providers

Register: your data in ESPAS

News / Announcements: The ESPAS Training School will be held in Warsaw from 19th to 23rd October 2015. See <http://www.espas-fp7.eu/school> for further details.

Information Block: ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts. Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

Footer: NEWS, EVENTS, PARTNERS, DATA PROVIDERS, The ESPAS Consortium - Copyright 2012, This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676, European Union flag logo.

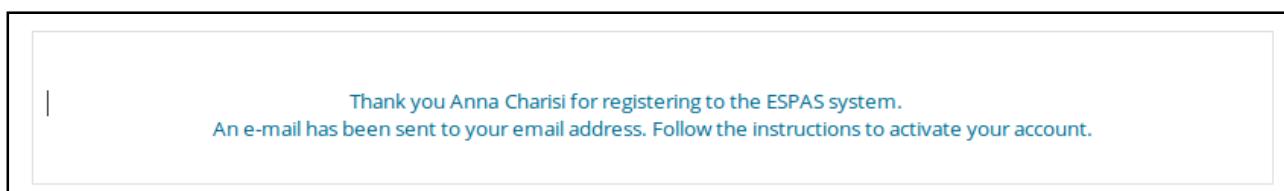
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- Provide the required information and click **Register**. Note that the fields marked with an asterisk (*) are mandatory.

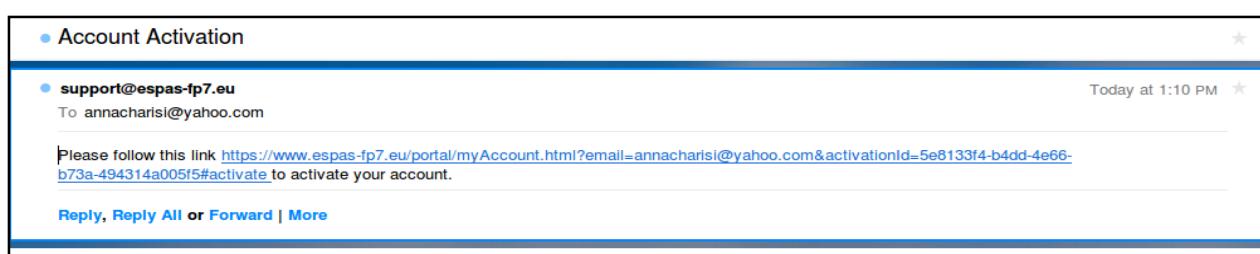
The screenshot shows the ESPAS registration form. At the top right are links for LOGIN, REGISTER, ESPAS Project, and Contact Us. Below that is the text "near earth space data infrastructure for e-science". The main form fields include:

- Name (*): Anna Charisi
- E-mail Address (*): annacharisi@yahoo.com
- Password (*): [REDACTED]
- Confirm Password (*): [REDACTED]
- Affiliation section:
 - Organisation Name (*): National Observatory of Athens
 - Domain (*): Academic / Research
 - Country (*): Greece
- Intended use of ESPAS data (*):
 - Academic
 - Commercial
- Comments: [Large text area]
- Data Provider: Check if you are a data provider administrator
- Register button

- A message is presented that confirms your registration to the ESPAS system and an e-mail has been sent to your email address with instructions on how to activate your account.



- Check your e-mail. An e-mail from the sender "support@espas-fp7.eu" has been sent that has a link in order to activate your account. Click on that link.



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5. Your account has been activated and you are automatically logged in the ESPAS and redirected to the **My Account → My Personal Info** page, in case you want to edit your information. Note the “Hello, name” that is presented in the top right menu, that confirms your logged in status.

The screenshot shows the 'My Personal Info' page of the ESPAS website. At the top, there is a navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The 'MY ACCOUNT' link is highlighted in blue. In the top right corner, there is a 'Hello, Anna Charisi' message, which is highlighted with a red box. Below the navigation bar, there is a sidebar titled 'IN THIS SECTION' with links for 'My Personal Info' (which is also highlighted with a red box), 'My Dataset File Downloads', 'My Data Values Downloads', and 'My Location Searches'. The main content area contains fields for editing personal information: Name (*), E-mail Address (*), Password (Optional), and Confirm Password (Optional). Below this, there is a section for 'Affiliation' with fields for Organisation Name (*), Domain (*), and Country (*). There are also sections for 'Intended use of ESPAS data (*)' (with options for Academic and Commercial), 'Comments' (a text area), and 'Data Provider' (a checkbox). A 'Submit' button is located at the bottom of the form.

Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT MY ACCOUNT

Edit your information

Name (*) Anna Charisi

E-mail Address (*) annacharisi@yahoo.com

Password (Optional) ••••••••

Confirm Password (Optional) ••••••••

Affiliation

Organisation Name (*) UOA

Domain (*) Academic / Research

Country (*) Greece

Intended use of ESPAS data (*) Academic Commercial

Comments

Data Provider Check if you are a data provider administrator

Submit

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1.3 Log in

For user login you need to follow the steps described below:

1. Click the **LOG IN** link in the top right menu bar.

The screenshot shows the official website for the near earth space data infrastructure for e-science. At the top, there is a navigation bar with links for LOG IN (highlighted with a red box), REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, there is a main content area with several sections: 'Search and Download' (with a sub-section about observations, collections, files or data from a large number of data providers), 'Register your data in ESPAS', 'News / Announcements' (with a note about the ESPAS Training School), and a summary of what ESPAS is. At the bottom, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with a European Union flag and copyright information.

2. Provide your credentials: email address and password, and click **Login**.

The screenshot shows the login page of the ESPAS website. It features a header with the ESPAS logo, navigation links for LOG IN, REGISTER, ESPAS Project, and Contact Us, and the tagline 'near earth space data infrastructure for e-science'. The main form for logging in asks for an ESPAS Account (E-mail Address) and Password. Below the form, there is a 'Forgot your password?' link. At the bottom, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with a European Union flag and copyright information.

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3. You are redirected to the “Home” page. Note the “Hello, name” that is presented in the top right menu, that confirms your logged in status.

The screenshot shows the ESPAS Home page. At the top, there is a navigation bar with links: HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The 'HOME' link is highlighted with a blue background. In the top right corner, there is a red box around the 'Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us' text. Below the navigation bar, there is a large central box containing text and icons. On the left side of this box, it says "ESPAS provides the following services:" followed by a numbered list: 1. Metadata search by (Time, Assets (Instruments and Models), Observed Properties, Observation Collections, Location); 2. Download of Data Files; 3. Download of extracted parameters (Plots of extracted parameters). To the right of this list are two boxes: "Search and Download" (describing observations, collections, files or data from a large number of data providers) and "Register" (your data in ESPAS). Below these boxes is a section titled "News / Announcements" with a bullet point about the ESPAS Training School. Further down, there is a general description of ESPAS as a data infrastructure and a note about access to a large number of repositories. At the bottom of the central box, there are four categories: NEWS (with a speech bubble icon), EVENTS (with a calendar icon), PARTNERS (with a people icon), and DATA PROVIDERS (with a gear icon). At the very bottom left is the European Union flag, and at the bottom center is the text "The ESPAS Consortium - Copyright 2012".

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1.3.1 Forgot Password

1. In case you have forgotten your password, then go to the “Home” page and click the **LOG IN** link in the top right menu bar. At the “Login” page, click the **Forgot your password?**link.

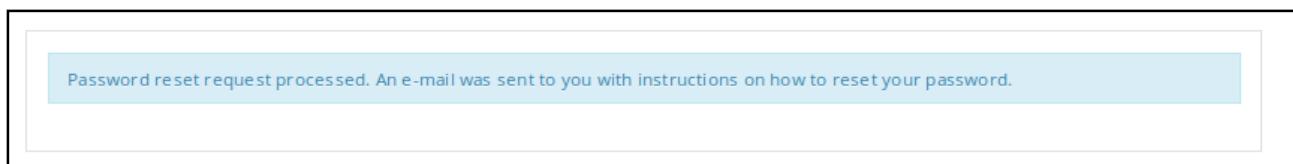
The screenshot shows the ESPAS login page. At the top, there is a logo with the text "near earth space data infrastructure for e-science". Below the logo, there are links for LOG IN, REGISTER, ESPAS Project, and Contact Us. A navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT follows. The main form area contains fields for "ESPAS Account (E-mail Address *)" and "Password (*)" with a "Login" button below them. A link "Forgot your password?" is located at the bottom left of the form area, which is highlighted with a red rectangular border. Below the form, there are four icons: NEWS (speech bubble), EVENTS (calendar), PARTNERS (two people), and DATA PROVIDERS (gears). At the bottom, there is a European Union flag icon and a copyright notice: "The ESPAS Consortium - Copyright 2012" and "This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676."

2. Provide your e-mail address and click **Submit**.

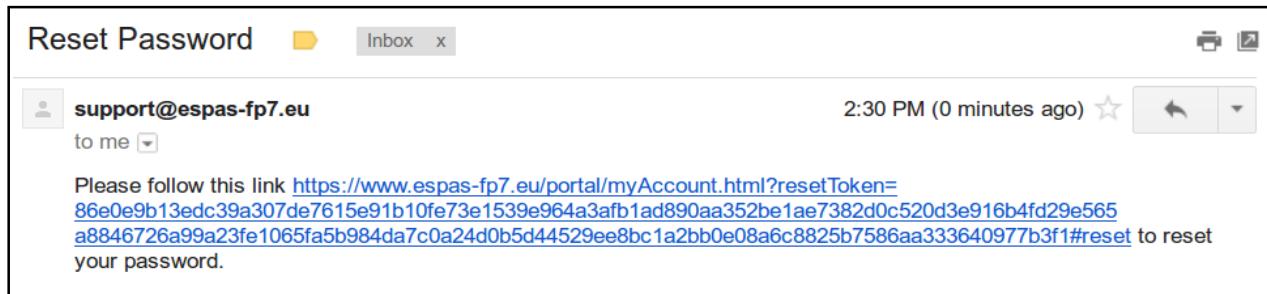
The screenshot shows the ESPAS password recovery page. At the top, there is a logo with the text "near earth space data infrastructure for e-science". Below the logo, there are links for LOG IN, REGISTER, ESPAS Project, and Contact Us. A navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT follows. The main form area contains a message: "Please enter the email address for your account. A verification code will be sent to you. Once you have received the verification code, you will be able to choose a new password for your account." Below this message is an input field for "E-mail Address (*)" containing the value "annacharisi@yahoo.com" and a "Submit" button. Below the form, there are four icons: NEWS (speech bubble), EVENTS (calendar), PARTNERS (two people), and DATA PROVIDERS (gears). At the bottom, there is a European Union flag icon and a copyright notice: "The ESPAS Consortium - Copyright 2012" and "This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676."

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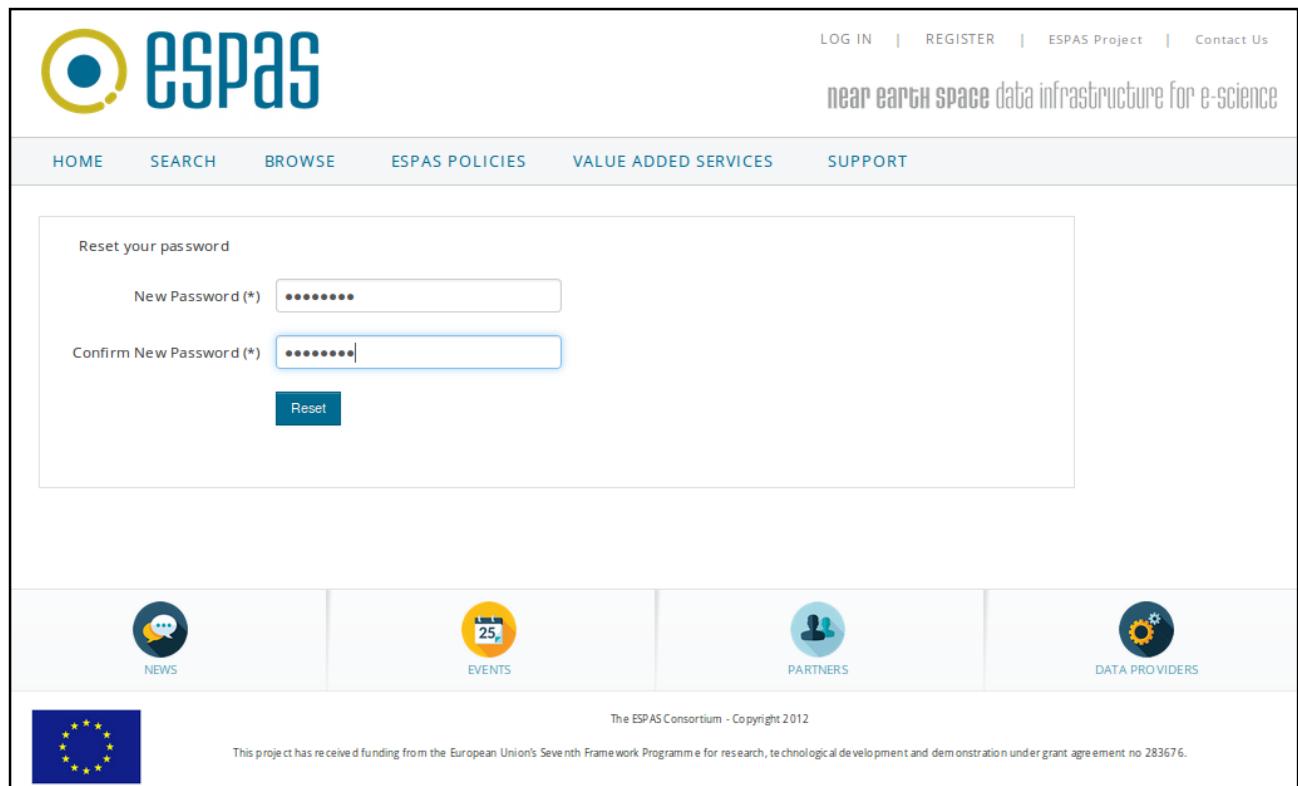
3. A message is presented that confirms your password reset request and an e-mail has been sent to you with instructions on how to reset your password.



4. Check your e-mail. An e-mail from the sender "support@espas-fp7.eu" has been sent that has a link in order to reset your password. Click on that link.



5. In the reset password page, give your new password twice in the appropriate fields and press **Reset**.



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6. Your password has been reset and you are automatically logged in the ESPAS and redirected to the **My Account → My personal info** page, in case you want to edit your information. Note the “Hello, name” that is presented in the top right menu, that confirms your logged in status.

The screenshot shows the 'Edit your information' page of the ESPAS 'My personal info' section. At the top, there is a navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The MY ACCOUNT link is highlighted in blue. In the top right corner, there is a red box around the 'Hello, Anna Charisi' greeting, followed by 'Sign Out', 'ESPAS Project', and 'Contact Us'. Below the navigation, the text 'near earth space data infrastructure for e-science' is displayed. On the right side, a sidebar titled 'IN THIS SECTION' lists 'My Personal Info', 'My Dataset File Downloads', 'My Data Values Downloads', and 'My Location Searches'. The main form area contains fields for Name (*), E-mail Address (*), Password (Optional), Confirm Password (Optional), Organisation Name (*), Domain (*), Country (*), Intended use of ESPAS data (*), Comments, and a Data Provider checkbox. A 'Submit' button is at the bottom.

Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT MY ACCOUNT

IN THIS SECTION

My Personal Info

My Dataset File Downloads

My Data Values Downloads

My Location Searches

Edit your information

Name (*) Anna Charisi

E-mail Address (*) annacharisi@yahoo.com

Password (Optional) *****

Confirm Password (Optional) *****

Affiliation

Organisation Name (*) UOA

Domain (*) Academic / Research

Country (*) Greece

Intended use of ESPAS data (*) Academic Commercial

Comments

Data Provider Check if you are a data provider administrator

Submit

1.4 Sign Out

- To log out from the ESPAS portal (provided that you have already logged in), click the **Sign Out** link in the top right menu bar. The **Sign Out** link is available to all pages of ESPAS Portal.

The screenshot shows the ESPAS Home page. At the top right, there is a red-bordered "Sign Out" button. The page features the ESPAS logo and navigation links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. A sidebar on the left lists services like Metadata search by time, assets, observed properties, etc. A central box contains "Search and Download" and "Register" options. Below these are "News / Announcements" and a summary of ESPAS as a data infrastructure. At the bottom, there are links for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

- You are logged out from ESPAS portal and you are redirected to the “Home” page.

This screenshot shows the same ESPAS Home page as above, but it is displayed after signing out. The "Sign Out" link is no longer present in the top right menu bar. The rest of the page content remains identical, including the sidebar services, central boxes, news announcements, and footer links.

1.5 ESPAS Project

- If you want more information about the ESPAS Project, click the **ESPAS Project** link in the top right menu bar.

The screenshot shows the homepage of the ESPAS project website (<http://www.espas-fp7.eu/>). The header includes a logo, navigation links (LOG IN, REGISTER, ESPAS Project, Contact Us), and a tagline "near earth space data infrastructure for e-science". Below the header are several sections: "ESPA5 provides the following services:" (listing metadata search, download of data files, and extracted parameters), "Search and Download" (observations, collections, files or data from a large number of data providers), "Register" (your data in ESPAS), and "News / Announcements" (a note about the ESPAS Training School). A central text block states that ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts. It also mentions access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors. At the bottom are links for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

- The ESPAS project website (<http://www.espas-fp7.eu/>) will open in a new tab/window.

The screenshot shows the ESPAS project website (<http://www.espas-fp7.eu/>) in a web browser. The layout is similar to the previous screenshot, featuring the ESPAS logo, navigation menu (HOME, OVERVIEW, COMMUNITY, NEWS & EVENTS, PUBLICATIONS), and a sidebar with links to the ESPAS Platform, Training School, Ontology, and Roadmap. The main content area features a "Welcome to the EU FP7 ESPAS Project" section with a detailed description of the project's aims and objectives, followed by a list of bullet points. To the right, there is a "Latest News" sidebar with articles about the ESPAS Training School and Project Granted Extension, along with a "Big Data from Space conference" announcement.

1.6 Contact Us

1. If you want to contact ESPAS administrator, click the **Contact Us** link in the top right menu bar.

The screenshot shows the ESPAS homepage. At the top right, there is a navigation bar with links: LOG IN, REGISTER, ESPAS Project, and Contact Us. The 'Contact Us' link is highlighted with a red box. Below the navigation bar, the ESPAS logo is displayed, followed by the text 'near earth space data infrastructure for e-science'. A horizontal menu bar includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The 'HOME' link is highlighted with a blue box. On the left side, there is a sidebar with text about services and a list of items. In the center, there are two boxes: 'Search and Download' and 'Register'. Below these is a section titled 'News / Announcements' with a list of events. At the bottom, there are four icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, each with a corresponding circular icon. A small European Union flag is at the bottom left, and a copyright notice is at the bottom right.

LOG IN | REGISTER | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT

ESPAS provides the following services:

1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
2. Download of Data Files
3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download
observations, collections, files or data from a large number of data providers

Register
your data in ESPAS

News / Announcements

- The ESPAS Training School will be held in Warsaw from 19th to 23rd October 2015. See <http://www.espas-fp7.eu/school> for further details.

ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

NEWS EVENTS PARTNERS DATA PROVIDERS

The ESPAS Consortium - Copyright 2012

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2. Provide the required information and the message you want to send to ESPAS administrator and click **Submit**. Note that the fields marked with an asterisk (*) are mandatory.

The screenshot shows the ESPAS website's "Contact Us" page. At the top, there is a navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT (which is highlighted in blue), and MY ACCOUNT. The main content area has a heading "Contact Us" and a sub-instruction: "Send an email to the system administrator. All fields with an * are required." Below this, there are four input fields: "Name (*)" with value "Anna Charisi", "E-mail Address (*)" with value "annacharisi@yahoo.com", "Subject (*)" with value "Interest on participating in ESPAS as Data Provider", and a larger "Message (*)" text area containing a message about becoming a Data Provider. A "Submit" button is located below the message area. To the right of the form, a sidebar titled "IN THIS SECTION" lists various links: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us (which is also highlighted in blue). At the bottom of the page, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

Contact Us

Send an email to the system administrator. All fields with an * are required.

Name (*) Anna Charisi

E-mail Address (*) annacharisi@yahoo.com

Subject (*) Interest on participating in ESPAS as Data Provider

Message (*)

Dear Sir/Madam,
I would like to inform me about the procedure that I should follow in order to become an official ESPAS Data Provider.

I am looking forward to hearing from you,
Anna Charisi

Submit

IN THIS SECTION

About ESPAS
ESPAS Data Model
ESPAS Space Physics Ontology
Glossary
ESPAS User's Manual
For Data Providers
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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283670.

3. A message is presented that confirms that your email was successfully sent to the ESPAS administrator.

Email to administrator was successfully sent

1.7 Search menu

ESPAS portal provides metadata searches for observations based on the following search criteria:

- Time period: the time period when the observations were acquired
- Assets: the instruments and models that were used for the generation of the observations
- Observed properties: the observed properties that were measured in the observations
- Observation collections: the collections that the observations belong to
- Location: the location of the platforms (ground-based observatories or satellites) on which the instruments are mounted and used for the generation of the observations

The metadata search is open to all users with no registration required.

In order to perform a query for observations, ESPAS portal supports two types of searches: the progressive search and the spatial/temporal search.

1.7.1 Progressive search

The progressive search helps you to construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (please visit Support → ESPAS Data Model and ESPAS Space Physics Ontology for more explanation). You can start your query with any of these criteria by clicking one of the buttons in the “Search & Download” page and then continue with any other to filter further your results. This means that the available options that are presented in each step are filtered by the previous selections. For example, if the Athens Digisonde has been selected in the Assets page, and then you click on the Observed Properties page, only the observed properties that are related with the Athens Digisonde instrument will be available for selection. You can submit your query at any stage of the progressive search.

Moreover, the Assets, Observed Properties and Observation Collections search pages are enriched with some extra filters presented in the left part of the pages that can be used to narrow down or facilitate your selection of the entities presented on the right. The definition of each filter is available in Support → Glossary section. You can select one or more options from each filter and use one or more filters at the same time. Note that the “OR” relationship is implied among the options of the same filter, and an “AND” relationship is implied between the filters. For example, in the Assets search page there are the filters: assets type, platform type and project. If one selects the sounder and magnetometer as asset type, then the assets of type sounder OR magnetometer are presented on the right. A high level query could be represented as: `asset type=sounder OR asset type=magnetometer`. But, if also the DIAS project is selected in the project filter, then the

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assets that are of type sounder OR magnetometer AND also belong to the DIAS project are presented. A high level query could be represented as: *project=DIAS AND (asset type=sounder OR asset type=magnetometer)*).

In the top part of each of the Search pages there is the **Current Selections** area where the current selected criteria by the user are presented. For example, the time period from 2013-01-01 00:00 to 2013-31-01 23:59 UTC and the Athens Digisonde has been selected so far in the picture below. On the right, there are the buttons (1) that link to the remaining search criteria in order to continue building your query. The buttons for the criteria that have already been selected are deactivated. Below these buttons, there is the **Back** button that returns you in the previous selected criteria to refine your selection. But, note that in that case your selections for the current criterion will be lost. You can submit your query anytime by clicking the **Submit** button. If you want to start a new search, click the **Start New Search** link below the Submit button.

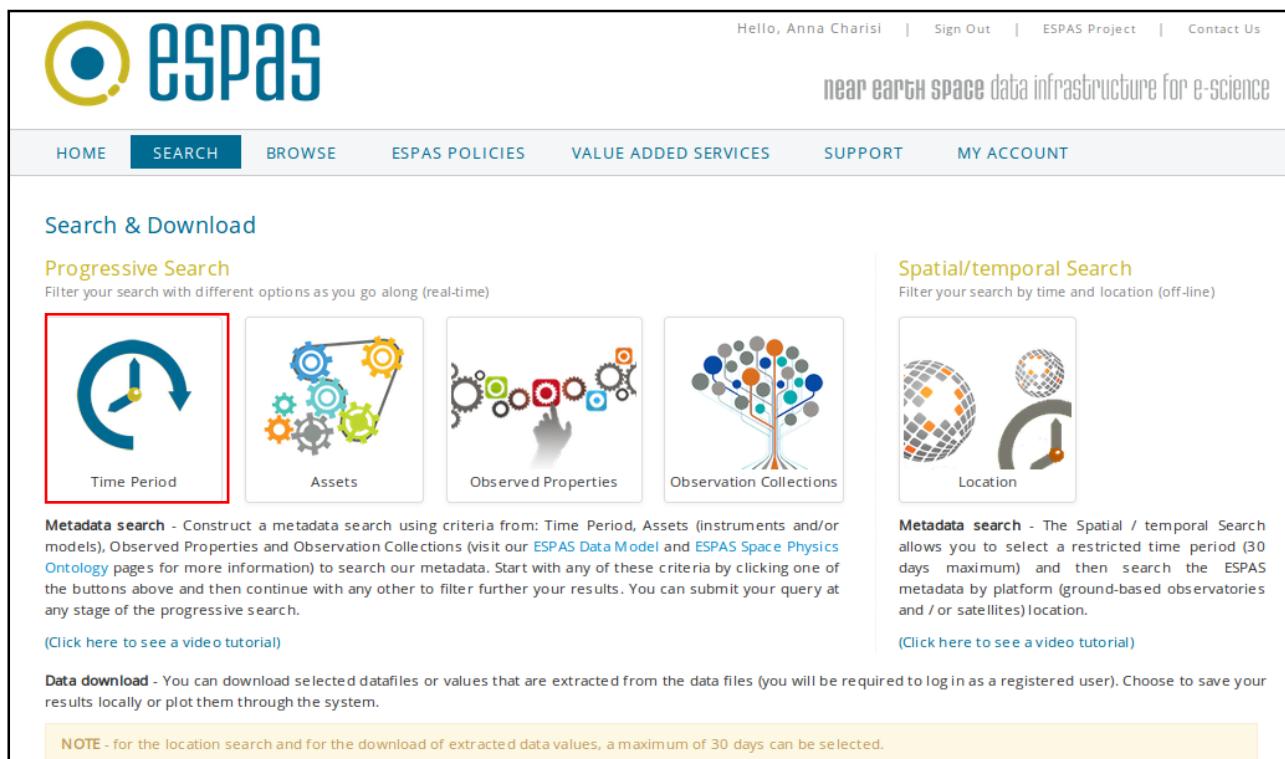
The screenshot shows the top navigation bar with links: HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. Below this is a 'Current Selections' section with the text: 'Time Periods: 2013-01-01 00:00 - 2013-01-31 23:59 [00:00 - 23:59] UTC' and 'Assets: Athens Digisonde'. To the right of this section is a row of four buttons labeled 'Time Period', 'Assets', 'Observed Properties', and 'Observation Collections', with the first button having a red border. Below these buttons are three more buttons: 'Back', 'Submit', and 'Start New Search'.

You can start a metadata query (progressive search) by selecting any of the criteria (time period, assets, observed properties or observation collections) in the “Search & Download” page. This page is available using the Search menu (main menu) or by clicking the **Search and Download** button in the home page.

The screenshot shows the 'Search & Download' page with the ESPAS logo at the top. The top navigation bar includes: HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. Below this is a 'Search & Download' section with a 'Progressive Search' section containing four buttons: 'Time Period' (with a clock icon), 'Assets' (with gears), 'Observed Properties' (with a tree icon), and 'Observation Collections' (with a globe icon). A red box highlights these four buttons. To the right is a 'Spatial/temporal Search' section with two buttons: 'Location' (with a globe icon) and 'Time Period' (with a clock icon). A red box highlights the 'Location' button. Below these sections are detailed descriptions of the search types and a note about data download. At the bottom are links for news, events, partners, and data providers.

1.7.1.1 Time Period

- In order to start a metadata search (progressive search) using as the first criterion the time period, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Time Period** button.



The screenshot shows the ESPAS homepage with the following layout:

- Header:** Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us
- Slogan:** near earth space data infrastructure for e-science
- Navigation Bar:** HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, MY ACCOUNT
- Section:** Search & Download
- Progressive Search:**
 - Time Period:** Represented by a clock icon with a red border.
 - Assets:** Represented by a cluster of gears.
 - Observed Properties:** Represented by a hand pointing at a gear.
 - Observation Collections:** Represented by a tree with colored circles.

Filter your search with different options as you go along (real-time)
- Spatial/temporal Search:**
 - Location:** Represented by a globe icon.

Filter your search by time and location (off-line)
- Metadata search:**
 - Time Period:** Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search.
 - Click here to see a video tutorial**
- Data download:** You can download selected datafiles or values that are extracted from the data files (you will be required to log in as a registered user). Choose to save your results locally or plot them through the system.
- Note:** NOTE - for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

- In the top part of the "Search by time period" page, there is the **Current Selections** area (see the section 1.6 Search menu for more information) where your selected criteria are presented.

Below this area, there are the **From date**, **To date** fields (A) to define your time period of interest in UTC timezone. Moreover, you can specify the subset of day in UTC (B) (this will apply for all days in the selected time period) by using the fields **Subset start** and **Subset end**.

So, you can specify a time period, e.g. from 1st to 10th January 2014, but also a subset of day, e.g. from 10:00 to 12:00 (UTC). This selection will return the observations that were acquired between 10:00 and 12:00 in UTC for the days from 1st to 10th January 2014. If you don't want to define any subset of day, leave the default values (00:00 to 23:59) for these fields.

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The screenshot shows the ESPAS search interface. At the top, there is a logo and links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the logo, it says "near earth space data infrastructure for e-science". The navigation bar includes HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. Under "Current Selections", it says "none". There are four icons: Time Period (selected), Assets, Observed Properties, and Observation Collections. Below these are Back, Submit, and Start New Search buttons. The main search area is titled "Search by time period" and contains fields for "Time period [start to end in UTC]" and "Subset of day [if any]". The "From date" and "To date" fields both show "2015/08/06 22:01". The "Subset start" field shows "00:00" and the "Subset end" field shows "23:59". A "Clear" button is also present.

3. Using the buttons on the right of the **From date** and **To date** fields, you can select the dates and times by using the supportive pop up windows.

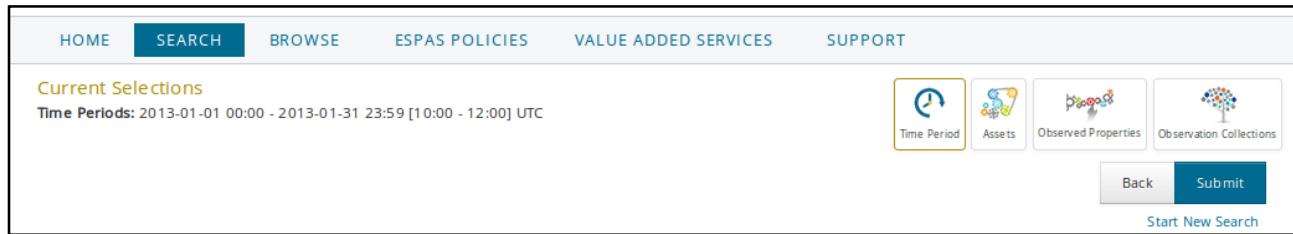
This screenshot shows a detailed time selection dialog for the "Subset of day" field. The dialog is centered over the search interface. It has a header "Subset of day [if any]" and two input fields: "Subset start" (00:00) and "Subset end" (23:59). Below these are two grids of time intervals from 0:00 to 23:00 in one-hour increments. A mouse cursor is hovering over the "22:00" button in the bottom row. The dialog has a "Today" button at the bottom. At the very bottom of the dialog, there are up and down arrow buttons for adjusting the hour and minute values. The background of the dialog shows the "EVENTS" icon.

4. If you want to define also a subset of day, click on the **Subset start** and **Subset end** fields and using the up and down arrows specify the start and end time (UTC).

This screenshot shows the same search interface as before, but the time selection dialog is now focused on the "Subset end" field. The "Subset end" field currently shows "12:00". Below it is a small dialog with up and down arrow buttons for adjusting the hour and minute. The "12" button is highlighted, indicating it is being selected. The "00" button is also visible. The background of the dialog shows the "DATA PROVIDERS" icon.

5. When you have finished with the "Time period" selection, your preferences are presented in the **Current Selections** area. You have now the following options:

- continue your metadata query by clicking on any of the activated buttons at the right (Assets, Observed Properties, Observation Collections)
- finish your query by clicking the **Submit** button or
- start a new search by clicking the **Start New Search** link.



1.7.1.2 Assets

- Within ESPAS, an asset corresponds to an Instrument or a Model or a software package that was used to generate an observation. In order to start a metadata search (progressive search) using as the first criterion the assets, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Assets** button.

The screenshot shows the ESPAS home page with the following layout:

- Header:** Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us
- Slogan:** near earth space data infrastructure for e-science
- Navigation Bar:** HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, MY ACCOUNT
- Section Title:** Search & Download
- Progressive Search:**
 - Time Period (clock icon)
 - Assets** (highlighted with a red box, gears icon)
 - Observed Properties (hand cursor over gear icons)
 - Observation Collections (tree icon)

Metadata search - Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search.

(Click here to see a video tutorial)
- Spatial/temporal Search:**
 - Location (person icon)

Metadata search - The Spatial / temporal Search allows you to select a restricted time period (30 days maximum) and then search the ESPAS metadata by platform (ground-based observatories and / or satellites) location.

(Click here to see a video tutorial)
- Note:** NOTE - for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

- In the top part of the Search by assets page, there is the **Current Selections** area (see the section 1.6 Search menu for more information) where your selected criteria are presented. Below this area, in the right part (A) there is a list of all the assets (in alphabetical order) that are associated with observations grouped as Instruments and Models. You can scroll down this list and select the assets you want to include in your metadata query. You can also use the **Select All** button or **Deselect All** to select and deselect all the options respectively. If you hover the mouse pointer over a specific instrument, a pop up window presents its description. The **Clear** button clears all the selections (including the filters).

In the left part (B) there are some filters (Instrument type, Platform, Project) that you can use to narrow down or facilitate your selection of assets presented in the right part. A hierarchical view of each filter is provided. Note also that the selection of an option, automatically selects all its siblings in the hierarchy. You can manually select or deselect the options by clicking the appropriate check boxes. The definition of each filter is available at Support → Glossary section. You can select one or more options from each filter and use one or more filters at the same time.

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Note that the “OR” relationship is implied among the options of the same filter, and an “AND” relationship is implied between the filters. If one selects the “sounder” and “magnetometer” as asset type, then the assets of type “sounder” OR “magnetometer” is presented on the right. A high level query could be represented as: *asset type=”sounder” OR asset type=”magnetometer”*. But, if also the “DIAS project” is selected at the project filter, then the assets that are of type “sounder” OR “magnetometer” AND also belong to the “DIAS project” are presented. A high level query could be represented as: *project=”DIAS” AND (asset type=”sounder” OR asset type=”magnetometer”)*.

The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo is displayed along with the tagline "near earth space data infrastructure for e-science". The main menu includes HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT.

The "Current Selections" section indicates "none". To the right of this section are four filter icons: Time Period, Assets (which is highlighted in yellow), Observed Properties, and Observation Collections. Below these are Back and Submit buttons, and a link to Start New Search.

The "Search by assets" section contains a heading "Select Assets on the right [Filter with available options on the left]". It provides instructions: "Assets (and their respective filter options) that are not related to an observation, are not displayed in this form. For a complete list of all the Assets (Instrument and Computations), Platforms and Projects registered in ESPAS you can visit the Browse -> Metadata section". There is a Clear button next to this text.

The "Filter by" section contains three expandable dropdown menus: Asset Type, Instrument types, Platform, and Project. The Asset Type menu has a search input field and "Select All" and "Deselect All" buttons. The Instrument types menu is expanded, showing categories like In Situ Sensing Instrument, which includes options such as Energetic Particle Detector, Langmuir Probe, Magnetometer, and Resonance Relaxation Sounder. The Platform and Project menus are currently collapsed.

The "Assets" section on the right contains a search input field with placeholder text "Start typing to select options...", "Select All", and "Deselect All" buttons. It lists a category "Instruments" with numerous items, each preceded by a checkbox:

- Alouette 1 Topside Sounder
- Alouette 2 Topside Sounder
- Andøya Magnetometer
- Athens Digisonde
- Bergen Magnetometer
- Bjørnøya Geomagnetic Observatory Magnetometer
- Castello Tesino Scalar Magnetometer
- Castello Tesino Vector Magnetometer
- Dombås Geomagnetic Observatory Magnetometer
- Dønna Magnetometer
- DTU Space fluxgate magnetometer
- EISCAT Kiruna Receiver

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3. The following example presents the use of the "Asset Type" filter, which defines the type of the asset (instrument or model) according to the corresponding controlled vocabulary (check also the Instrument and Computation type at the Browse → ESPAS Space Physics Ontology page). The filter presents in a hierarchical view all the assets types that are related with at least one observation. Using the buttons **Select All** or **Deselect All** you can select or deselect all the options, respectively.

In this example, the Sounder option (including all the children) has been selected from the "Asset Type" filter and on the right only the Assets (instruments in this case) that are of type Sounder, Ionosonde or Vertical Ionosonde are presented. If you are happy with the list of assets presented on the right, select the ones you want to be included in your metadata query by clicking the check boxes. Otherwise, you can use the other filters: Platform and/or Project

The screenshot shows the 'Search by assets' interface. On the left, under 'Filter by', there is a section for 'Asset Type' with a dropdown menu and a list of options. The 'Sounder' option is selected, and its children 'Ionosonde' and 'Vertical Ionosonde' are also selected. There are 'Select All' and 'Deselect All' buttons. Below this are sections for 'Platform' and 'Project'. On the right, under 'Assets', there is a search bar and 'Select All'/'Deselect All' buttons. A list of assets is shown, with 'Athens Digisonde' selected. A tooltip for 'Athens Digisonde' provides a detailed description: 'Athens Digisonde is an ionospheric station produced by Lowell Digisonde International, capable of making measurements of the overhead ionosphere, and provides real-time on-site processing and analysis to characterize radio signal propagation in support of communications or surveillance operations, and enhance ionospheric research efforts. Athens Digisonde is installed in Palaiakastro Penteli (38.03 lat, 23.52 lon). Athens Digisonde data can be accessed through <http://www.iono.no.gr>'.

4. Click on the "Platform" on the left to view all the options for this filter, which defines the platform type where the instruments are mounted on (check also the Platform type vocabulary at the Browse → ESPAS Supporting Vocabularies page). By clicking an option on the left, the list of assets is updated to reflect the selections. You can choose the options for the platform according to your preferences. Then, select your assets of interest by clicking the check boxes on the right.

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Search by assets

Select Assets on the right [Filter with available options on the left]
Assets (and their respective filter options) that are not related to an observation, are not displayed in this form. For a complete list of all the Assets (Instrument and Computations), Platforms and Projects registered in ESPAS you can visit the Browse -> Metadata section

Filter by

- Asset Type
- Platform
- Project

Assets

Start typing to select options...

Instruments

- UCL FPI Svalbard Red and Green Lines

5. Click on the "Project" filter on the left to view all the options. This filter defines the project that the instruments/models are associated with (check also the Project entries at the Browse → ESPAS Metadata page). By clicking an option on the left, the list of assets appeared on the right is updated to reflect the selections. You can choose the options for the project according to your preferences. In the example below, the DIAS project has been selected and at the right all the assets (instruments and models) that are associated with this project are presented. Select your assets of interest by clicking the check boxes.

Search by assets

Select Assets on the right [Filter with available options on the left]
Assets (and their respective filter options) that are not related to an observation, are not displayed in this form. For a complete list of all the Assets (Instrument and Computations), Platforms and Projects registered in ESPAS you can visit the Browse -> Metadata section

Filter by

- Asset Type
- Platform
- Project

Assets

Start typing to select options...

Instruments

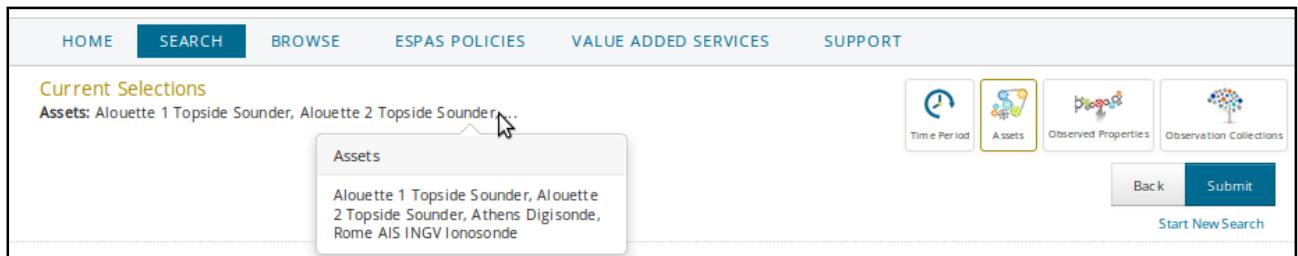
- Athens Digisonde

Models

- ARTIST
- DIAS Ne3D
- Lockwood Formula
- SIRM
- SIRMUP
- TaD (Topside Sounders Model assisted by Digisonde)

6. When you have finished with the "Assets" selection, your selected assets are presented at the **Current Selections** area. You have now the following options:

- continue your metadata query by clicking on any of the activated buttons at the right (Time Period, Observed Properties, Observation Collections)
- finish your query by clicking the **Submit** button or
- start a new search by clicking the **Start New Search** link.



1.7.1.3 Observed Properties

- In order to start a metadata search (progressive search) using as the first criterion the observed properties, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Observed Properties** button. For more information on the “observed property” specifications, please visit Support → ESPAS Data Model page and Support → ESPAS Space Physics Ontology.

The screenshot shows the ESPAS homepage with the following layout:

- Header:** Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us
- Logo:** espas
- Navigation Bar:** HOME, SEARCH (highlighted), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, MY ACCOUNT
- Section: Search & Download**
- Progressive Search:**
 - Time Period (clock icon)
 - Assets (gears icon)
 - Observed Properties** (highlighted with a red box, gears icon)
 - Observation Collections (tree icon)

Metadata search - Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search.

(Click here to see a video tutorial)
- Spatial/temporal Search:**
 - Location (person icon)

Metadata search - The Spatial / temporal Search allows you to select a restricted time period (30 days maximum) and then search the ESPAS metadata by platform (ground-based observatories and / or satellites) location.

(Click here to see a video tutorial)
- Note:** NOTE - for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

- In the top part of the "Search by observed properties" page, there is the **Current Selections** area (see also the section “1.6 Search menu” for more information) where your selected criteria are presented. Below this area, in the right part (A) there is a list of all the observed properties (in alphabetical order) that are associated with observations. You can scroll down this list and select the observed properties you want to include in your metadata query. You can also use the **Select All** button or **Deselect All** to select and deselect all the options, respectively. If you hover the mouse pointer over a specific observed property, a pop up window presents its description. The **Clear** button clears all the selections (including the filters).

In the left part (B) there are some filters (Phenomenon, Measurand, Qualifier) that you can use to narrow down or facilitate your selection of observed properties presented in the right part. A hierarchical view of each filter is provided. Note also that the selection of an option, automatically selects all its siblings in the hierarchy. You can manually select or deselect the options by clicking the appropriate check boxes. The definition of each filter is available at Support → ESPAS Space Physics Ontology page. You can select one or more options from each filter and use one or more filters at the same time.

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Note that the “OR” relationship is implied among the options of the same filter, and an “AND” relationship is implied between the filters. If one selects the “ion” and “electron” as phenomenon, then the observed properties with phenomenon “ion” OR “electron” are presented on the right. A high level query could be represented as: *phenomenon=“ion” OR phenomenon=“electron”*. But, if also the “temperature” is selected at the “measurand” filter, then the observed properties with phenomenon “ion” OR “electron” AND measurand equal to “temperature” are presented. A high level query could be represented as: *measurand=“temperature” AND (phenomenon=“ion” OR phenomenon=“electron”)*.

The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo is displayed, followed by the text "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT.

In the center, there is a section titled "Current Selections" which says "none". To the right of this, there are four icons: Time Period (clock), Assets (globe), Observed Properties (molecule), and Observation Collections (tree). Below these icons are buttons for Back, Submit, and Start New Search.

Under the "Search by observed properties" heading, there is a sub-section titled "Filter by". This section contains three expandable dropdown menus: "Phenomenon", "Field", and "Measurand". The "Phenomenon" menu is currently expanded, showing options like "Select All" and "Deselect All", along with checkboxes for "Electric Field", "Magnetic Field", "Particle", "Charged Particle", and "Ion".

To the right of the filter section is a "Observed Properties" panel. It features a search input field with placeholder text "Start typing to select options...", and two buttons: "Select All" and "Deselect All". Below the search input is a list of observed properties, each preceded by a checkbox and a brief description. The list includes:

- Electron Density (Ne)
- Total Electron Content (I)
- Total Vertical Electron Content (I)
- Magnetic Field (B)
 - Magnetic Field NED Eastward Component (Y)
 - Magnetic Eastward NED Field Strength Variation (dBy)
 - Magnetic Field NED Northward Component (X)
 - Magnetic Northward NED Field Strength Variation (dBx)
 - Magnetic Field Vertical Component (Z)
 - Magnetic Vertical Field Strength Variation (dBz)
- Minimum frequency of Reflections from Plasma Layer (fmin)
 - Minimum frequency of ionospheric reflections in E region (fminE)
 - Minimum frequency of ionospheric reflections in Es layer (fminEs)

3. The following example presents the use of the "Phenomenon" filter (check also the Phenomenon vocabulary at the Browse → ESPAS Space Physics Ontology page). The filter presents in a hierarchical view all the phenomenon entries of the observed properties that are related with at least one observation. Using the buttons **Select All** or **Deselect All** you can select or deselect all the options respectively.

In this example, the “Wave” option has been selected from the “Phenomenon” filter (and all its siblings) and on the right, the observed properties that are of wave phenomenon are presented. If you hover the mouse pointer over a specific observed property, a pop up window presents its description. If you are happy with the list of

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observed properties presented on the right, select the ones you want to be included in your metadata query by clicking the check boxes. Otherwise, you can use the other filters: Measurand and/or Qualifier.

The screenshot shows the 'Search by observed properties' interface. On the left, under 'Filter by', there are three sections: 'Phenomenon', 'Measurand', and 'Qualifier'. In the 'Phenomenon' section, 'Wave' is expanded, showing 'Electromagnetic Wave' and 'Plasma Wave' (with 'Electron Plasma Wave' checked). In the 'Measurand' section, 'Frequency (f)' is expanded, showing various frequency-related options like 'Blanketing Frequency (fb)', 'Collision Frequency (v)', 'Critical Frequency (f)', etc. On the right, the 'Observed Properties' list is displayed, starting with 'Auroral (particle) E-layer Critical Frequency (foEa)'. A specific item, 'F2-layer Critical Frequency (foF2)', is highlighted with a blue border and a tooltip: 'The ordinary wave critical frequency of the highest stratification in the F region of ionosphere'. At the bottom of the list, there is a note: 'F2-layer X-mode Critical Frequency (fxF2) F2-layer Z-mode Critical Frequency (fzF2)'.

- Click on the Measurand on the left to view all the options for this filter (check also the Measurand vocabulary at the Browse → ESPAS Space Physics Ontology page). Clicking an option on the left, the list of the observed properties is updated at the right to reflect the selections. You can choose the options for the measurand according to your preferences. Then, select the observed properties you want to be included in your metadata query by clicking the check boxes.

This screenshot shows the same interface as above, but with different selection in the 'Measurand' section. Under 'Frequency (f)', 'Critical Frequency (f)' is checked. In the 'Observed Properties' list, several items are selected: 'E-layer Critical Frequency (foE)', 'F1-layer Critical Frequency (foF1)', and 'F2-layer Critical Frequency (foF2)'. Other items like 'Auroral (particle) E-layer Critical Frequency (foEa)' and 'F2-layer X-mode Critical Frequency (fxF2)' are also present in the list.

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5. Click on the Qualifier on the left to view all the options for this filter (check also the Qualifier vocabulary at the Browse → ESPAS Space Physics Ontology page). Clicking an option at the left, the list of the observed properties is updated at the right to reflect the selections. You can choose the options for the qualifier according to your preferences. Then, select the observed properties you want to be included in your metadata query by clicking the check boxes.

The screenshot shows a search interface for observed properties. On the left, under 'Filter by', there are dropdown menus for 'Phenomenon' and 'Measurand', and a 'Qualifier' section with a dropdown menu and a list of options. The 'Qualifier' list includes 'Vector Magnitude', '2D Vector', 'At Half Maximum Output', 'At Maximum Output', 'Average' (which is checked), and 'Maximum'. On the right, under 'Observed Properties', there is a search bar and a list of options: 'Frequency Spread of E layer trace (FE)', 'Frequency Spread of F layer trace (FF)', 'Range Spread of E layer trace (QE)', and 'Range Spread of F layer trace (QF)'. There are 'Select All' and 'Deselect All' buttons above the list.

6. When you have finished with the "Observed Properties" selection, your selected observed properties are presented in the **Current Selections** area. You have now the following options:

- continue your metadata query by clicking on any of the activated buttons at the right (Time Period, Assets, Observation Collections)
- finish your query by clicking the **Submit** button or
- start a new search by clicking the **Start New Search** link.

The screenshot shows the 'Current Selections' page. At the top, there are navigation links: HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. Below this, the 'Current Selections' area displays 'Observed Properties: E-layer Critical Frequency, F1-layer Critical Frequency, ...'. A mouse cursor is hovering over the 'Observed Properties' link. To the right, there are four buttons: 'Time Period' (with a clock icon), 'Assets' (with a gear icon), 'Observed Properties' (with a globe icon, highlighted in orange), and 'Observation Collections' (with a tree icon). At the bottom right, there are buttons for 'Back', 'Submit', and 'Start New Search'.

1.7.1.4 Observation Collections

- In order to start a metadata search (progressive search) using as the first criterion the observation collections, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Observation Collections** button. Within ESPAS, an observation collection corresponds to any set of existing observations. For more information, please visit Support → Glossary page.

The screenshot shows the ESPAS home page with the following layout:

- Header:** Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us. Below it is the tagline: near earth space data infrastructure for e-science.
- Navigation Bar:** HOME, SEARCH (highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, MY ACCOUNT.
- Section: Search & Download**
 - Progressive Search:** Filter your search with different options as you go along (real-time). It includes four icons: Time Period (clock with a circle), Assets (interlocking gears), Observed Properties (gears and a hand cursor), and Observation Collections (a tree with nodes).
 - Spatial/temporal Search:** Filter your search by time and location (off-line). It includes two icons: Location (a globe with a grid) and a person icon.
- Text:**
 - Metadata search -** Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search.
 - (Click here to see a video tutorial)**
 - Data download -** You can download selected datafiles or values that are extracted from the data files (you will be required to log in as a registered user). Choose to save your results locally or plot them through the system.
 - NOTE -** for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

- In the top part of the “Search by observation collections” page, there is the **Current Selections** area (see also the section “1.6 Search menu” for more information) where your selected criteria are presented. Below this area, in the right part (A) there is a list of all the observation collections (in alphabetical order) that are associated with at least one observation. You can scroll down this list and select the observation collections you want to include in your metadata query. You can also use the **Select All** button or **Deselect All** to select and deselect all the options, respectively. If you hover the mouse pointer over a specific observation collection, a pop up window presents its description. The **Clear** button clears all the selections (including the filters).

In the left part (B) there are some filters (Region of Space, Dimensionality) that you can use to narrow down or facilitate your selection of observation collections presented in the right part. A hierarchical view of each filter is provided. Note also that the selection of an option, automatically selects all its siblings in the hierarchy. You can manually select or deselect the options by clicking the appropriate check boxes. The definition of each filter is available in Support → Glossary page. You can select one or more options from each filter and use one or more filters at the same time.

Note that the “OR” relationship is implied among the options of the same filter, and an

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"AND" relationship is implied between the filters. If one selects the "ionosphere" and "thermosphere" as "region of space", then the observation collections with region of space "ionosphere" OR "thermosphere" are presented on the right. A high level query could be represented as: *region of space="ionosphere" OR region of space="thermosphere"*. But, if also the "1D profile" is selected at the dimensionality filter, then the observation collections with region of space "ionosphere" OR "thermosphere" AND dimensionality equal to "1D profile" are presented. A high level query could be represented as: *dimensionality="1D profile" AND (region of space="ionosphere" OR region of space="thermosphere")*.

Current Selections
none

Search by observation collections

Select Observation Collections on the right [Filter with available options on the left]

Observation Collections that are not related to an observation, are not displayed in this form. For a complete list of all the Observation Collections registered in ESPAS you can visit the Browse -> Metadata section

Clear

Filter by

Region of Space

Start typing to select options...

Select All Deselect All

Earth

- Earth's Near Surface
 - Ionosphere
 - Plasmasphere
 - Thermosphere
- Earth's Magnetosphere

Dimensionality

Observation Collection

Start typing to select options...

Select All Deselect All

- Alouette 1 Electron Density Profiles
- Alouette 2 Electron Density Profiles
- Andenes Magnetometer Data
- Athens Digisonde SAO files (autoscaled)
- Automatically Prospected IMAGE RPI Plasmagram Images
- Bergen Magnetometer Data
- Bjørnøya Magnetometer Data
- CTS 1 minute XYZF variations
- DEMETER IAP - Characteristics of Low Energy Ions in Burst Mode (DMT_N1_1139)
- DEMETER IAP - Characteristics of Low Energy Ions in Survey Mode (DMT_N1_1140)
- DEMETER ISL - Langmuir Probe Results (Plasma Parameters) in Burst Mode (DMT_N1_1143)
- DEMETER ISL - Langmuir Probe Results (Plasma Parameters) in Survey Mode (DMT_N1_1144)

Back Submit Start New Search

3. The following example presents the use of the "Region of Space" filter (check also the "Feature Of Interest" vocabulary in the Browse → ESPAS Space Physics Ontology page). The filter presents in a hierarchical view all the region of space entries of the observation collections that are related with at least one observation. Using the buttons **Select All** or **Deselect All** you can select or deselect all the options, respectively.

In this example, the "Ionosphere" option has been selected from the Region of Space filter and on the right the corresponding observation collections are presented. If you hover the mouse pointer over a specific observation collection, a pop up window presents its description. If you are happy with the list of observation collections

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presented on the right, select the ones you want to be included in your metadata query by clicking the check boxes. Otherwise, you can use the other filter: Dimensionality.

The screenshot shows the 'Search by observation collections' interface. On the left, under 'Filter by', there are two sections: 'Region of Space' and 'Dimensionality'. Under 'Region of Space', there is a tree view with 'Earth' expanded, showing 'Earth's Near Surface' with 'Ionosphere' checked, and 'Thermosphere' and 'Earth's Magnetosphere' unselected. Under 'Dimensionality', there is a tree view with '1D' expanded, showing '1D Profile' with '1D Altitude Profile' and '1D Vertical Altitude Profile' both checked, and '2D' with '2D Cross Section' unselected. On the right, under 'Observation Collection', there is a list of options with 'Athens Digisonde SAO files (autoscaled)' selected. A tooltip for this option provides a detailed description: 'Athens Digisonde SAO files (autoscaled) This collection contains the SAO (text) files produced by Athens Digisonde (38.03 degrees N, 23.52 degrees W). Each SAO file contains the autoscaled characteristics for one ionogram including the echo traces h'(t), echo amplitudes, frequency and range spread and most of the important ionospheric characteristics together with the electron density profile (where available). SAO stands for Standard Archiving Output format. A description of the SAO format (versions 4.2 and 4.3) can be found at: http://ucar.uml.edu/digisonde.html'.

- Click on the "Dimensionality" on the left to view all the options for this filter (check also the "Dimensionality" vocabulary in the Browse → ESPAS Supporting Vocabularies page). Clicking an option on the left, the list of the observation collections appeared on the right is updated to reflect the selections. You can choose the options for the dimensionality according to your preferences. Then, select the observation collections you want to be included in your metadata query by clicking the check boxes.

The screenshot shows the 'Search by observation collections' interface. On the left, under 'Filter by', there are two sections: 'Region of Space' and 'Dimensionality'. Under 'Dimensionality', there is a tree view with '1D' expanded, showing '1D Profile' with '1D Altitude Profile' and '1D Vertical Altitude Profile' both checked, and '2D' with '2D Cross Section' unselected. On the right, under 'Observation Collection', there is a list of options with several checked: 'Alouette 1 Electron Density Profiles', 'Alouette 2 Electron Density Profiles', 'Andenes Magnetometer Data', 'Athens Digisonde SAO files (autoscaled)', 'Bergen Magnetometer Data', 'Bjørnøya Magnetometer Data', 'DEMETER IAP - Characteristics of Low E', 'DEMETER IAP - Characteristics of Low E', 'DEMETER ISL - Langmuir Probe Results (F (DMT_N1_1143))', 'DEMETER ISL - Langmuir Probe Results (F (DMT_N1_1144))', 'DIAS Bottomside Electron Density Nowcasting Maps', and 'DIAS daily f-plots of fmin,foF2 from Athens Digisonde'.

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5. When you have finished with the selection of the observation collections, your selections are presented in the **Current Selections** area. You have now the following options:

- continue your metadata query by clicking on any of the activated buttons on the right (Time Period, Assets, Observed Properties)
- finish your query by clicking the **Submit** button or
- start a new search by clicking the **Start New Search** link.

The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links: HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. Below the navigation bar, the title "Current Selections" is displayed, followed by the text "Observation Collections: Alouette 1 Electron Density Profiles, Alouette 2 Electron Density Profiles, ...". A mouse cursor is hovering over the "Alouette 2 Electron Density Profiles" link. A tooltip box appears, containing the text "Observation Collections" and a list of selected items: "Alouette 1 Electron Density Profiles, Alouette 2 Electron Density Profiles, Andenes Magnetometer Data, Athens Digisonde SAO files (autoscaled)". To the right of the tooltip, there is a row of four buttons: "Time Period" (clock icon), "Assets" (gear icon), "Observed Properties" (atom icon), and "Observation Collections" (tree icon). Below these buttons are two more buttons: "Back" and "Submit" (highlighted in blue). At the bottom right of the interface, there is a link "Start New Search".

1.7.2 Spatial/temporal Search

The Spatial/temporal Search performs a metadata search using as criteria the time period (up to a maximum of 30 days) and the location of the platform (ground-based observatories and/or satellites) on which the instruments are mounted and used for the generation of the observations. The completion time of spatial/temporal requests depends strongly on your preferences. In case you are not logged in the portal, you have to stay in the “Search by time and location” page to view the results. Instead, it is highly recommended to register and login to ESPAS portal in order to be notified via e-mail when the requests are completed and to monitor them through **My Account → My Location Searches** menu.

1.7.2.1 Location

1. In order to perform a metadata search using as criteria the time and platform location, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Location** button under the Spatial/temporal search header.

The screenshot shows the ESPAS portal homepage. At the top, there is a navigation bar with links for HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The user is logged in as Anna Charisi. Below the navigation bar, there is a banner for "near earth space data infrastructure for e-science". The main content area features two sections: "Progressive Search" and "Spatial/temporal Search". The "Progressive Search" section includes icons for Time Period, Assets, Observed Properties, and Observation Collections. The "Spatial/temporal Search" section includes icons for Location and a person. A note below the "Location" icon states: "Metadata search - The Spatial / temporal Search allows you to select a restricted time period (30 days maximum) and then search the ESPAS metadata by platform (ground-based observatories and / or satellites) location." At the bottom, there are links for "Click here to see a video tutorial" and "NOTE - for the location search and for the download of extracted data values, a maximum of 30 days can be selected." There are also links for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS.

2. In the top part of the “Search by time and location” page, there is the **Current Selections** area (1) (see also the section “1.6 Search menu” for more information) where the selected criteria are presented. Below this area, there is the time period selection form (2) where you can specify the time period of your interest and the platform location selection form (3) where you can specify the platform location.

The screenshot shows the ESPAS search interface with three sections highlighted by red boxes:

- Section 1 (Top Left): Current Selections**

 - Header: Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us
 - Section title: Current Selections
 - Description: none
 - Buttons: Back, Submit, Start New Search

- Section 2 (Middle Left): Search by time and location**

 - Section title: Select a period of the observations [Option: specify the time of day to narrow down your results]
 - Form fields:

Time period [start to end in UTC]	Subset of day ⓘ [if any]
From date: 2015/08/09 10:51	Subset start: 00:00
To date: 2015/08/09 10:51	Subset end: 23:59
 - Buttons: Clear

- Section 3 (Bottom Right): Select the location of the platforms (ground-based observatories and / or satellites)**

 - Section title: Select the location of the platforms (ground-based observatories and / or satellites)
 - Form fields:

Coordinates in GEO	Coordinates in GSE	
Select coordinates	<input checked="" type="radio"/> Cartesian <input type="radio"/> Spherical	
<input checked="" type="radio"/> Bounding Box		
Lower bound refers to the smaller and upper bound refers to the larger values in a mathematical sense		
Enter the coordinates of the lower bound		
X(km): 000.00	Y(km): 000.00	Z(km): 000.00
Enter the coordinates of the upper bound		
X(km): 000.00	Y(km): 000.00	Z(km): 000.00
<input type="radio"/> Bounding Sphere		
Enter the sphere's radius		
Radius (km): 000.00		
Enter the coordinates of the sphere's center		
X(km): 000.00	Y(km): 000.00	Z(km): 000.00

3. In case you are not logged in, a message is displayed that recommends you to register and login to ESPAS portal in order to be notified via e-mail when the location requests are completed and to monitor them through **My Account → My Location Searches** menu.

Search by time and location

Not logged in?
Location queries are off-line and may take a long time to complete. This would require you to stay in this page to view the results. Instead, register and login to be notified via e-mail when they are completed and to monitor them through your account.

4. In the time period selection form, there are the **From date**, **To date** fields (A) to define your time period of interest in UTC timezone. Note that a maximum of 30 days can be selected. Moreover, you can specify the subset of day in UTC (B) (this will apply for all days in the selected time period) by using the fields **Subset start** and **Subset end**. So, you can specify a time period, e.g. from 1st to 10th January 2014, but also a subset of day, e.g. from 10:00 to 12:00 (UTC). This selection will match the observations that were acquired between 10:00 and 12:00 in UTC for the days from 1st to 10th January 2014. If you don't want to define any subset of day, leave the default values (00:00 to 23:59) for these fields.

Search by time and location

Select a period of the observations [Option: specify the time of day to narrow down your results] Clear

Time period [start to end in UTC]	Subset of day <small>[if any]</small>
From date <input type="text" value="2014/01/01 00:00"/> 	Subset start <input type="text" value="10:00"/>
To date <input type="text" value="2014/01/10 23:59"/> 	Subset end <input type="text" value="12:00"/>

5. Regarding the platform location, you can specify an area of interest in one of the following coordinates systems:

- Geocentric (GEO) coordinate system in two representations:
 - Geocentric (GEO) Cartesian (also known as Cartesian Earth Centred Earth Fixed (ECEF)) in Cartesian representation (x, y, z), where the x-axis is in the equatorial plane and intersects the prime meridian (usually Greenwich). The y-axis is also in the equatorial plane; it lies at right angles to the x-axis and intersects the 90-degree meridian. The z-axis coincides with the polar axis and is positive toward the North Pole. The origin is located at the center of the sphere or spheroid.
 - Geocentric (GEO) spherical (also known as Spherical Earth Centred Earth Fixed (ECEF)) in spherical representation (lat, lon, alt), where "alt" is the distance from the center of the Earth in km (the mean Earth radius is 6371 km).
- Geocentric Solar Ecliptic (GSE), Cartesian system having its origin at the center of the Earth, the X-axis pointing toward the center of the Sun, the Z-axis to the ecliptic north pole, the Y-axis completing the right-handed system.

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For the GEO Cartesian representation you can define a bounding box or a bounding sphere. The bounding box is defined by the coordinates (X, Y, Z in km) of the lower and upper bound given in the appropriate text fields. In the following example a bounding box having as lower bound the point with coordinates: X = 3518, Y = 1280, Z = 5154 and as upper bound the point with coordinates: X = 3633, Y = 1694, Z = 4951 is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Select coordinates Cartesian Spherical

Bounding Box Bounding Sphere

Lower bound refers to the smaller and upper bound refers to the larger values in a mathematical sense

Enter the coordinates of the lower bound

X (km) 3518	Y (km) 1280	Z (km) 5154
----------------	----------------	----------------

Enter the coordinates of the upper bound

X (km) 3633	Y (km) 1694	Z (km) 4951
----------------	----------------	----------------

Enter the sphere's radius
Radius (km)
000.00

Enter the coordinates of the sphere's center

X (km) 000.00	Y (km) 000.00	Z (km) 000.00
------------------	------------------	------------------

6. For the GEO Cartesian representation, the bounding sphere is defined by the coordinates (X, Y, Z in km) of the sphere's center and the radius (in km) given in the appropriate text fields. In the following example, a bounding sphere with center the point with coordinates: X = 3518, Y = 1280, Z = 5154 and 100 Km radius is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Select coordinates Cartesian Spherical

Bounding Box Bounding Sphere

Lower bound refers to the smaller and upper bound refers to the larger values in a mathematical sense

Enter the coordinates of the lower bound

X (km) 000.00	Y (km) 000.00	Z (km) 000.00
------------------	------------------	------------------

Enter the coordinates of the upper bound

X (km) 000.00	Y (km) 000.00	Z (km) 000.00
------------------	------------------	------------------

Enter the sphere's radius
Radius (km)
100

Enter the coordinates of the sphere's center

X (km) 3518	Y (km) 1280	Z (km) 5154
----------------	----------------	----------------

7. For the GEO Spherical representation, you can define a rectangular or a circular area. The rectangular area is defined by the coordinates (latitude, longitude in degrees) of the lower left and upper right corner, and the vertical extend given in the appropriate text fields. The vertical extend should be described from the minimum distance beyond mean Earth radius (km) up to the maximum distance beyond mean Earth radius (km). The mean Earth radius is equal to 6371 km. If you leave the vertical extend fields empty, it is implied that the vertical extend equals to 0 km, which means that the rectangular area you have defined lies on the Earth's surface. In the following example, a rectangular area with lower left corner the point with coordinates Latitude = 36 degrees, Longitude = 20 degrees, upper right corner the point with coordinates Latitude = 39 degrees, Longitude = 25 degrees and vertical extend from 100 to 500 Km above the Earth surface is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO
[Coordinates in GSE](#)

Select coordinates Cartesian Spherical

1. Horizontal Plane

RectangularArea Circular Area

Lower left corner refers to the smaller and upper right corner refers to the larger values in a mathematical sense (e.g. 30 deg < 60 deg but -60 deg < -30 deg)

Enter the coordinates of the lower left corner

Latitude (deg)	Longitude (deg)
36	20

Enter the coordinates of the upper right corner

Latitude (deg)	Longitude (deg)
39	25

2. Vertical Extent

mean Earth radius = 6371 km

Minimum distance beyond mean Earth radius (km):

Maximum distance beyond mean Earth radius (km):

8. For the GEO Spherical representation, the circular area is defined by the coordinates (latitude, longitude in degrees) of the sphere's center and the radius (km), and the vertical extend given in the appropriate text fields. The vertical extend should be described from the minimum distance beyond mean Earth radius (km) up to the maximum distance beyond mean Earth radius (km). The mean Earth radius is equal to 6371 km. If you leave the vertical extend fields empty, it is implied that the vertical

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extend equals to 0 km, which means that the circular area you have defined above lies on the Earth's surface. In the following example, a circular area with center the point with coordinates Latitude = 36 degrees, Longitude = 20 degrees, 100 km radius and vertical extend from 100 to 500 Km above the Earth surface is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Select coordinates Cartesian Spherical

1. Horizontal Plane

RectangularArea Circular Area

Lower left corner refers to the smaller and upper right corner refers to the larger values in a mathematical sense (e.g., 30 deg < 60 deg but -60 deg < -30 deg)

Enter the coordinates of the lower left corner

Latitude (deg) 000.00	Longitude (deg) 000.00
--------------------------	---------------------------

Enter the coordinates of the upper right corner

Latitude (deg) 000.00	Longitude (deg) 000.00
--------------------------	---------------------------

Enter the coordinates of the circular area's center

Latitude (deg) 36	Longitude (deg) 20
----------------------	-----------------------

2. Vertical Extent

mean Earth radius = 6371 km

Minimum distance beyond mean Earth radius (km):
100

Maximum distance beyond mean Earth radius (km):
500

9. For the GSE coordinate system you can define a bounding box or a bounding sphere. The bounding box is defined by the coordinates (X, Y, Z in km) of the lower and upper bound given in the appropriate text fields. In the following example a bounding box having as lower bound the point with coordinates: X = 362508, Y = 11345, Z = 47620 and as upper bound the point with coordinates: X = 531932, Y = 31149, Z = 68602 is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Bounding Box Bounding Sphere

Lower bound refers to the smaller and upper bound refers to the larger values in a mathematical sense

Enter the coordinates of the lower bound

X (km) 362508	Y (km) 11345	Z (km) 47620
------------------	-----------------	-----------------

Enter the coordinates of the upper bound

X (km) 531932	Y (km) 31149	Z (km) 68602
------------------	-----------------	-----------------

Enter the coordinates of the sphere's center

X (km) 000.00	Y (km) 000.00	Z (km) 000.00
------------------	------------------	------------------

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10. For the GSE coordinate system, the bounding sphere is defined by the coordinates (X, Y, Z in km) of the sphere's center and the radius (km) given in the appropriate text fields. In the following example, a bounding sphere with center the point with coordinates: X = 362508, Y = 11345, Z = 47620 and 1000 Km radius is defined.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Bounding Box
Lower bound refers to the smaller and upper bound refers to the larger values in a mathematical sense

Enter the coordinates of the lower bound

X (km) <input type="text" value="000.00"/>	Y (km) <input type="text" value="000.00"/>	Z (km) <input type="text" value="000.00"/>
---	---	---

Enter the coordinates of the upper bound

X (km) <input type="text" value="000.00"/>	Y (km) <input type="text" value="000.00"/>	Z (km) <input type="text" value="000.00"/>
---	---	---

Bounding Sphere
Enter the sphere's radius

Radius (km)

Enter the coordinates of the sphere's center

X (km) <input type="text" value="362508"/>	Y (km) <input type="text" value="11345"/>	Z (km) <input type="text" value="47620"/>
---	--	--

11. When you have finished with the time period and platform location selection, your selected time period and platform location are presented in the **Current Selections** area. You have now the following options:

- finish your query by clicking the **Submit** button or
- start a new search by clicking the **Start New Search** link.

HOME **SEARCH** BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT MY ACCOUNT

Current Selections

Time Period: 2014-01-01 00:00 - 2014-01-10 23:59 [10:00 - 12:00] UTC
Observing Platform Location: GEO coordinates, Horizontal Plane (Rectangular area) - Lower left corner (lat, lon): (36, 20) /
Upper right corner (lat, lon): (39, 25) -- Vertical Extent - (minAlt, maxAlt): (100, 500)

1.7.3 Results/Location Results Page

After the submission of a progressive or spatial/temporal search request, the “Results” or “Location Results” page is presented respectively. In the top part of the “Results”/“Location Results” page there is the **Current Selections** area (1) where the user selected criteria that generated the results are presented. On the right, there is the **Back** button (2) that returns you in the previous selected criterion to refine your selection. But, note that in that case the results will be lost and you should resubmit your query. If you wish to start a new search, click the **Start New Search** link (3) below the Submit button.

The observations that satisfy the query criteria are presented in the “Results”/“Location Results” page grouped by the Observation Collections they belong to. So, in the bottom part of the “Results”/“Location Results” page, a list of the Observation Collections that contain the observations that satisfy the user selected criteria is presented on the right (4). On the left, there are several filters (5) that you can use to refine the search results. If you click on the name of the filter (e.g. Instrument), a list of all the values related to the results (Observation Collections) presented on the right is given.

1 Current Selections
Observed Properties: F2-layer Critical Frequency
Time Periods: 2009-01-01 00:00 - 2009-01-15 23:59 [00:00 - 23:59] UTC

2

3 Start New Search

4 Observation Collections (8)

- ✓ Athens Digisonde SAO files (autoscaled)
- ✓ DIAS daily f-plots of fmin,foF2 from Athens Digisonde
- ✓ DIAS SIRMUP nowcasting maps of foF2
- ✓ EISCAT Ionomsonde observations
- ✓ IRI foF2 grids - CCIR F peak model
- ✓ IRI foF2 grids - URSI F peak model
- ✓ Validated Values of the Ionospheric Characteristics Recorded at Gibrilmanra from 1976 to 2009

5 Refine by

- ✓ Project
- ✓ Observation Collection
- ✓ Instrument
- ✓ Region of Space
- ✓ Platform
- ✓ Model
- ✓ Dimensionality Timeline
- ✓ Dimensionality Instance

Number of Observations : 120 [Download](#) [Data Providers' status](#) [Share your results](#)

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1. If you wish to download data (data files or data values) from a subset of the resulting Observation Collections, you should use the filters on the left to refine the results presented on the right to the desired ones. This is an alternative way instead of submitting a new query. In the following example, clicking on the **Instrument** filter, a list of the Instruments that are related with the resulting observations is given.

Results
Select Download dataset files or data values (observed properties) and go to My Account to monitor their progress

Refine by

- Project
- Observation Collection
- Instrument
 - Athens Digisonde (2)
 - EISCAT Tromsø Dynasonde (15)
 - Gibilmanna AIS INGV Ionosonde (1)
 - Rome AIS INGV Ionosonde (1)
- Region of Space
- Platform
- Model
- Dimensionality Timeline
- Dimensionality Instance

Number of Observations : 120

[Download](#) [Data Providers' status](#) [Share your results](#)

Observation Collections (8)

- Athens Digisonde SAO files (autoscaled)
- DIAS daily f-plots of fmin,foF2 from Athens Digisonde
- DIAS SIRMUP nowcasting maps of foF2
- EISCAT Ionosonde observations
- IRI foF2 grids - CCIR F peak model
- IRI foF2 grids - URSI F peak model
- Validated Values of the Ionospheric Characteristics Recorded at Gibilmanna from 1976 to 2009
- Validated Values of the Ionospheric Characteristics Recorded at Rome from 1976 to 2009

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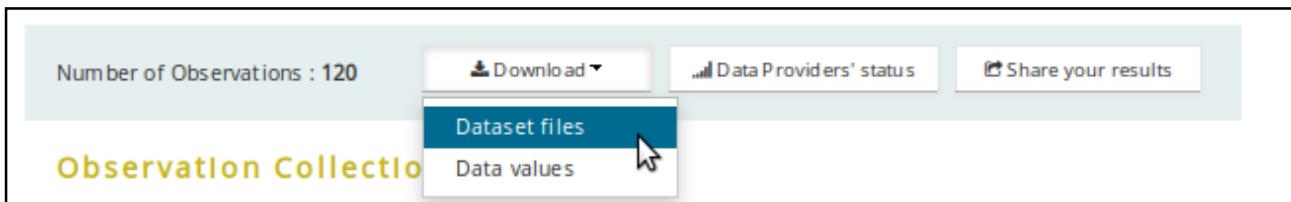
2. You can click on a specific instance (Athens Digisonde instrument in this example) and the resulting Observation Collections are refined on the right. Now, if you request a download for data files or values, only the data from the new set of Observation Collections presented on the right will be downloaded. If you want to remove the filter, click the X next to the filter, to retrieve the previous list of results.

The screenshot shows the 'Results' section of the ESPAS interface. On the left, there is a sidebar titled 'Refine by' with several dropdown menus: Project, Observation Collection, Instrument, Region of Space, Platform, Model, Dimensionality Timeline, and Dimensionality Instance. Under 'Instrument', 'Athens Digisonde (2)' is selected. On the right, there is a summary bar with 'Number of Observations : 2', a 'Download' button, a 'Data Providers' status' button, and a 'Share your results' button. Below this is a list titled 'Observation Collections (2)' containing two items: 'Athens Digisonde SAO files (autoscaled)' and 'DIAS daily f-plots of fmin,foF2 from Athens Digisonde'. The 'Athens Digisonde (2)' item in the sidebar has a red 'X' icon next to it, indicating it is currently selected.

3. If you click on the name of a specific Observation Collection on the right, the description of this collection is presented, as shown below.

The screenshot shows the detailed description of the 'Athens Digisonde SAO files (autoscaled)' collection. At the top, there is a summary bar with 'Number of Observations : 120', a 'Download' button, a 'Data Providers' status' button, and a 'Share your results' button. Below this is a list titled 'Observation Collections (8)' containing one item: 'Athens Digisonde SAO files (autoscaled)'. A detailed description follows: 'This collection contains the SAO (text) files produced by Athens Digisonde (38.03 degrees N, 23.52 degrees W). Each SAO file contains the autoscaled characteristics for one ionogram including the echo traces h'(f), echo amplitudes, frequency and range spread and most of the important ionospheric characteristics together with the electron density profile (where available). SAO stands for Standard Archiving Output format. A description of the SAO format (versions 4.2 and 4.3) can be found at: <http://ulcar.uml.edu/digisonde.html>'. At the bottom, there are navigation arrows, a page number 'page 1 of 1', and a table with 'Date' (2008-12-23 15:15:00 - 2009-02-18 16:00:00) and 'Product(s)' (AthensSAOfile (text/sao)).

- In order to request for download of dataset files, click the **Dataset files** option from the **Download** drop down menu. You will be prompted to log in the ESPAS portal, if you are not already logged in. Note that the download always refers to the data from the Observation Collections currently presented at the “Results”/“Location Results” page.



- The “Dataset Files Download” page opens in a pop up window. You may give a name to your download request. If you leave it empty, the default name will be the submission date/time of the request. You should tick the box “I agree to all the Licences” and click the **Download** button in order to submit your download request. See also section “Download of Data Files” for an example on how to perform a download of data files request.

You can give a name to your download request. If you leave it empty the default name will be the date of the request.

Request name

Licences

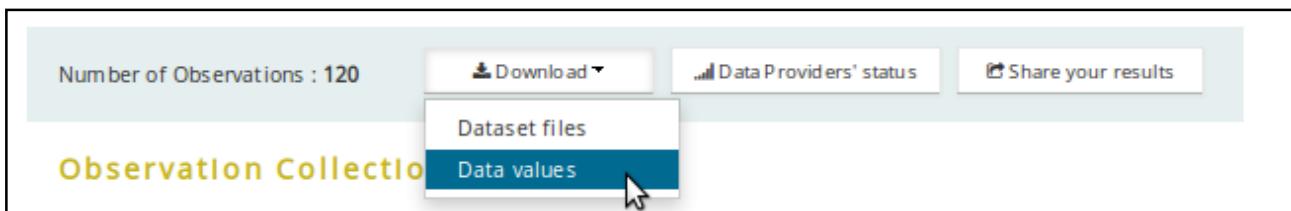
I agree to all the Licences

I agree to the EISCAT Rules of the Road licence

NOA's Terms of Reference

Download

- In order to request for download of data values, click the **Data values** option from the **Download** drop down menu. You will be prompted to log in the ESPAS portal, if you are not already logged in. Note that the download always refers to the data from the Observation Collections currently presented at the “Results”/“Location Results” page.

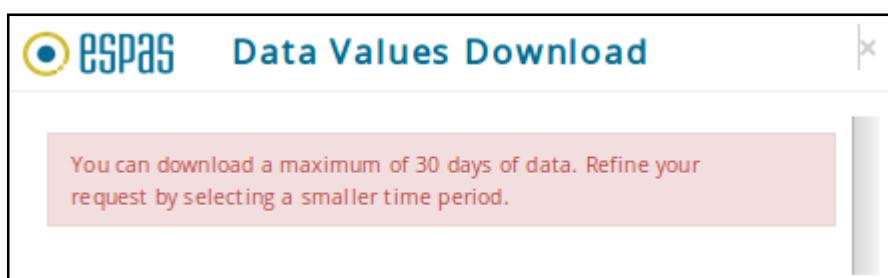


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7. The “Data Values Download” page opens in a pop up window. You can select from the list presented which observed properties you wish to download by clicking on the appropriate check boxes. You may give a name to your download request. If you leave it empty, the default name will be the submission date/time of the request. You should tick the box “I agree to all the Licences” and click the **Download** button in order to submit your download request. See also section “Download of Data Values” for an example on how to perform a download of data values request.

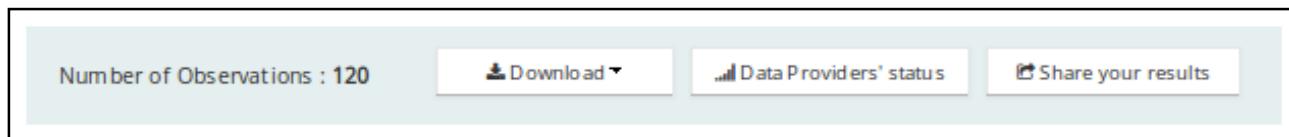
The screenshot shows the "Data Values Download" dialog box. At the top, there is a logo and the title "Data Values Download". Below the title, a sub-instruction says "Select which observed properties to download" with a "Filter..." button. A scrollable list contains two items: "Title" (unchecked) and "F2-layer Critical Frequency" (checked). Below this list, another instruction says "Give a name to your download request. Otherwise it will default to the request date." followed by a "Request name" input field containing "foF2 values for January 2009". Under the heading "Licences", there are two sections. The first section, "I agree to all the Licences", has a checked checkbox and a dropdown menu showing "EISCAT Rules of the Road". The second section, "I agree to the EISCAT Rules of the Road licence", also has a checked checkbox and a dropdown menu showing "NOA's Terms of Reference". At the bottom right of the dialog is a blue "Download" button.

8. If the selected time period exceeds the 30 days, a message is presented which prompts you to refine your request by selecting a smaller time period by making a new query.



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9. Before you proceed for a download request, you can check the data providers' status (online/offline) by clicking the **Data Providers' status** button.



10. The “Data Providers’ Status” page opens in a pop up window that presents a list of the ESPAS Data Providers related with the results and their status (online/offline). The green tick (✓) implies that the Data Provider is online and ready to accept requests for download of data files and data values. The red mark (✗) implies that the Data Provider is currently not available. This means that the requests for dataset files will be processed as soon as the provider becomes available, whereas requests for data values will not be processed. The date of the last update of the status is also presented at the right column.

The screenshot shows a pop-up window titled "Data Providers' Status". It contains a table with the following data:

#	Data Provider's Name	Status	Last Update Date
1	EISCAT	✗	2015-08-07 20:17:04
2	EISCAT	✓	2015-08-12 11:15:05
3	Istituto Nazionale di Geofisica e Vulcanologia	✗	2015-08-08 11:16:00
4	Istituto Nazionale di Geofisica e Vulcanologia	✓	2015-08-12 11:15:02
5	National Observatory of Athens	✗	2015-08-08 11:16:10
6	National Observatory of Athens	✓	2015-08-12 11:15:02

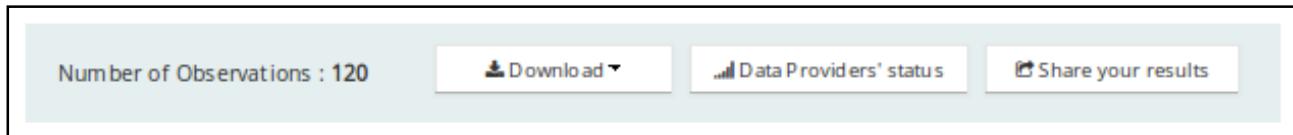
Below the table, there is a legend explaining the status icons:

- ✓ - Data Provider is online and ready to accept requests.
- ✗ - Data Provider is currently not available. Requests for dataset files will be processed as soon as the provider becomes available whereas requests for data values will not be processed.

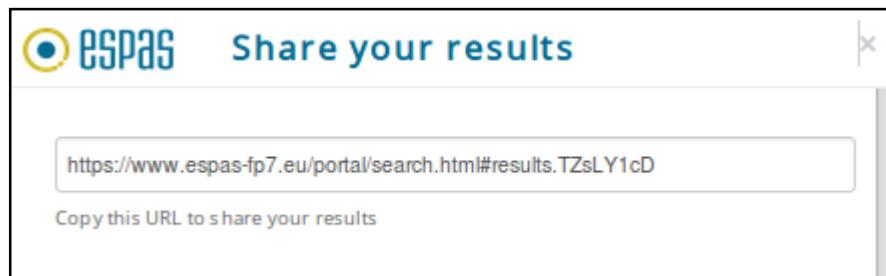
11. If you wish to share your results with your colleagues, click the **Share your results** button. See section 1.7.31 “Share your results” for more information.

1.7.3.1 Share your results

1. If you wish to share your results with your colleagues, click the **Share your results** button presented in the “Results”/”Location Results” page.



2. The “Share your results” page opens in a pop up window. You can copy the URL that is presented in the text box and paste it wherever you wish (an email, document etc). The other person can view the results page of your request using this URL. However, one can proceed to download requests only if your colleague is registered and logged in the ESPAS portal.



1.8 Browse menu

The Browse menu provides information regarding the ESPAS metadata, the ESPAS Space Physics Ontology and the ESPAS Supporting Vocabularies.

1.8.1 ESPAS Metadata

ESPAS provides access to observations (data) of the Near-Earth Space using relevant information (metadata), such as the assets (instruments and models) that generated the observation, the observed properties that were measured during the observation, etc. All this information that characterizes an observation (e.g. when the observation took place, what it was measured, by which instrument, etc.) is called metadata and is organised according to the ESPAS Data Model. For more information on the ESPAS Data Model, please visit the **Support → ESPAS Data Model** page.



near earth space data infrastructure for e-science

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ESPAS Data Model

The ESPAS data model is built entirely on ISO 19100 series geographic information standards, particularly the ISO 19156 Observations and Measurements (O&M) standard. This standardisation facilitates interoperability with other information systems and provides freedom to mix and match information system components without compromising overall success [ISO 19101:2002].

The general structure of the ESPAS data model gives a central place to the concept of "**observation**". According to [Fowler, 1998] an *observation is an act that results in the estimation of the value of a feature property using a designated procedure, such as a sensor, instrument, algorithm or process chain*. An observation is associated with a discrete time instant or period through which a number, term or other symbol is assigned to a phenomenon. The result of an observation is an estimate of the value of a property of some feature, so the details of the observation are metadata concerning the value of the feature property.

EXAMPLE Measuring (the act of the observation) the F2-layer Critical Frequency (foF2) of the Ionosphere above Athens at 1/1/2015 16:00 GMT. The *featureOfInterest* is the ionosphere, the *observedProperty* is the foF2, the *procedure/process* is the acquisition made by the Athens Digisonde mounted on NOA platform and the *result* is 5.2 MHz.

Following this approach the data which ESPAS data model is aimed at describing is always considered as observation results and the observation together with its properties provide relevant metadata.

Besides the main concept of Observation, the other related concepts that are used in ESPAS data model are listed below, while a high level overview of the relationships among them is presented at Figure 1.

```

graph TD
    Observation[Observation] <--> FeatureOfInterest[Feature Of Interest<br/>(e.g. Ionosphere)]
    Observation <--> Project[Project]
    Observation <--> Process[Process]
    Observation <--> Result[Result]
    Observation <--> Individual[Individual]
    Observation <--> Organization[Organization]
    Observation <--> Computation[Computation<br/>(e.g. IRI Model)]
    Observation <--> Acquisition[Acquisition]
    Process <--> CompositeProcess[Composite Process]
    Process <--> Acquisition
    Process <--> Computation
  
```

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The ESPAS metadata browser provides information for all the metadata that is registered in the ESPAS system grouped by the main concepts of the ESPAS Data Model. Note that the metadata browser presents entities even if there are no observations related to them, while in the search pages only the entities with related observations are presented. For example, suppose that an ESPAS Data Provider has registered the Instrument A in the ESPAS system, but there are no observations related with this specific instrument in the system. In this case, the Instrument A will be visible in the metadata browser, under the Instruments category, but this instrument won't be presented at the **Search → Assets** page.

1. In order to browse the ESPAS metadata, click on the **Browse → ESPAS Metadata** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The BROWSE menu is currently active, with a dropdown menu showing "ESPAS Metadata" as the selected option, along with other items like "ESPAS Space Physics Ontology" and "ESPAS Supporting Vocabularies". To the right of the menu, there are two boxes: one for "Search and Download" (observations, collections, files or data from a large number of data providers) and one for "Register" (your data in ESPAS). Below these boxes, there is a "News / Announcements" section with a bullet point about the ESPAS Training School. Further down, there is a statement about ESPAS being a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment. At the bottom, there are four icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, each with a corresponding circular icon. The NEWS icon features a speech bubble, the EVENTS icon features a calendar with the number 25, the PARTNERS icon features two people, and the DATA PROVIDERS icon features a gear. The European Union flag is also present at the bottom left.

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2. The metadata browser is presented, where you can navigate to all ESPAS metadata by clicking the main categories (ESPAS Data Model concepts) that are presented in the left column. Clicking a specific instance on the left, detailed information for this entity are presented on the right side.

The screenshot shows the ESPAS homepage with a navigation bar at the top featuring links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is a header with the text "near earth space data infrastructure for e-science" and the ESPAS logo. A horizontal menu bar includes links for HOME, SEARCH, BROWSE (which is highlighted in blue), ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. To the right of the menu is a sidebar titled "IN THIS SECTION" containing links for ESPAS Metadata, ESPAS Space Physics Ontology, and ESPAS Supporting Vocabularies. The main content area is titled "Navigate in ESPAS" and contains a search bar with the placeholder "Start typing to select options...". A list of categories is shown on the left: Data Providers, Individuals, Organisations, Platforms, Projects, Instruments, Operations, Computations, Acquisitions, Composite Processes, and Observation Collections.

3. For example, if you click on the **Instruments** (in the left column), a list of all the instruments registered in ESPAS is presented in the right side. Note that the name that appears inside the parenthesis in all instances in the left column represents their “localId” (a unique identifier for the ESPAS system) and is mainly useful for the ESPAS Data Providers.

The screenshot shows the same ESPAS homepage as above, but with the "Instruments" category selected in the left sidebar. The main content area now displays detailed information about instruments. It includes a heading "Instruments" with a descriptive text: "Designations for the measuring instruments/sensors which interact with the feature of interest in order to obtain an estimate of the observed property in an Observation." Below this, a list of instrument names is provided, each with its localId in parentheses: ACE Magnetometer (ace-mag), ACE SWEPM (ace-sweepam), Alouette 1 Topside Sounder (nasa-alouette1), Alouette 2 Topside Sounder (nasa-alouette2), Andøya Magnetometer (ANDMagnetometer), Athens Digisonde (Athens Digisonde), Bergen Magnetometer (BERMagnetometer), Bjørnøya Geomagnetic Observatory Magnetometer, Castello Tesino Scalar Magnetometer, Castello Tesino Vector Magnetometer, CHAMP Languir Probe, Dombås Geomagnetic Observatory Magnetometer, Dønna Magnetometer, and DTU Space fluxgate magnetometer.

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4. Click on a specific instance either in the left column or the right side and detailed information is presented for this instance. For this example, click on the **Athens Digisonde** and detailed information (such as description, instrument type, etc.) is presented in the right side. Note that the links that are presented on the right will point you to the corresponding entries.

The screenshot shows the 'Navigate in ESPAS' interface. On the left, a sidebar lists categories like Data Providers, Individuals, Organisations, etc., with 'Instruments' expanded. Under Instruments, 'Athens Digisonde' is selected and highlighted. The main content area displays detailed information about the Athens Digisonde, including its description as an ionospheric station produced by Lowell Digisonde International, its location in Palaia Penteli, and its website (<http://www.iono.noa.gr>). It also shows the instrument version (DPS4), type (Vertical Ionosonde), responsible parties (Anna Belehaki - Point of contact, National Observatory of Athens - Holder), and operational modes (Drift Ionogram and Scanning Ionogram). A 'IN THIS SECTION' sidebar on the right lists ESPAS Metadata, ESPAS Space Physics Ontology, and ESPAS Supporting Vocabularies.

5. As another example, click on **Observation Collections** in the left column. A list of all the observation collections registered in ESPAS are presented in the right side.

The screenshot shows the 'Navigate in ESPAS' interface. On the left, the 'Observation Collections' category is selected and highlighted. The main content area lists various observation collections, including Alouette 1 Electron Density Profiles, Andenes Magnetometer Data, Athens Digisonde SAO files (autoscaled), Automatically Prospected IMAGE RPI Plasmagram Images, Bergen Magnetometer Data, Bjørnøya Magnetometer Data, CHAMP P-AI-3-NRT, CHAMP Topside Ionosphere/Plasmasphere Reconstruction, CTS 1 minute XYZ variations, DEMETER IAP - Characteristics of Low Energy Ions in Burst Mode (DMT_N1_1139), DEMETER IAP - Characteristics of Low Energy Ions in Survey Mode (DMT_N1_1140), and DEMETER ISL - Langmuir Probe Results (Plasma Parameters) in Burst Mode (DMT_N1_1143). A 'IN THIS SECTION' sidebar on the right lists ESPAS Metadata, ESPAS Space Physics Ontology, and ESPAS Supporting Vocabularies.

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6. Click on the **Athens Digisonde SAO files (autoscaled)** collection and detailed information is presented in the right side.

The screenshot shows the ESPAS user interface. On the left, there is a navigation sidebar titled "Navigate in ESPAS" with a search bar and a list of categories: Data Providers, Individuals, Organisations, Platforms, Projects, Instruments, Operations, Computations, Acquisitions, Composite Processes, and Observation Collections. Under Observation Collections, several items are listed: Alouette 1 Electron Density Profiles (nasa-alouette1), Alouette 2 Electron Density Profiles (nasa-alouette2), Andenes Magnetometer Data (ANDdata), Athens Digisonde SAO files (autoscaled) (AthensSAO), and Automatically Prospected IMAGE. The "Athens Digisonde SAO files (autoscaled)" item is highlighted with a gray background. The main content area on the right displays detailed information about this collection, including its description, a query string, responsible parties, and a sidebar titled "IN THIS SECTION" with links to ESPAS Metadata, ESPAS Space Physics Ontology, and ESPAS Supporting Vocabularies.

Athens Digisonde SAO files (autoscaled)

This collection contains the SAO (text) files produced by Athens Digisonde (38.03 degrees N, 23.52 degrees W). Each SAO file contains the autoscaled characteristics for one ionogram including the echo traces $h'(f)$, echo amplitudes, frequency and range spread and most of the important ionospheric characteristics together with the electron density profile (where available). SAO stands for Standard Archiving Output format. A description of the SAO format (versions 4.2 and 4.3) can be found at: <http://ulcar.uml.edu/digisonde.html>

Query

```
project="http://resources.espas-fp7.eu/project/noa/DIAS/1"
" AND process ="http://resources.espas-fp7.eu/compositeProcess/noa/athDig-artist/1" AND observedProperty="http://ontology.espas-fp7.eu/compositeObservedProperty/noa-sao"
```

Responsible parties

Anna Belehaki - Point of contact
National Observatory of Athens - Data Provider

IN THIS SECTION

- ESPAS Metadata
- ESPAS Space Physics Ontology
- ESPAS Supporting Vocabularies

7. Similarly, you can browse all the ESPAS metadata by navigating through the entries in the left column.

1.8.2 ESPAS Space Physics Ontology

The ESPAS data portal manages a set of vocabularies of Space Physics keywords that can be used to narrow down data searches to observations of specific physical content. These vocabularies constitute the ESPAS space physics ontology that is the cornerstone of the data search functions specific to the ESPAS domain.

In order to simplify navigation through the wealth of ESPAS Space Physics vocabulary terms, the ontology is organized in several hierarchies of terms connected to each other via a “parent-child” relationship. Understanding the ontology hierarchies is critical for efficient data search and discovery in ESPAS. For more information on the ESPAS space physics ontology, please visit the **Support → ESPAS Space Physics Ontology** page.

ESPAS Space Physics Ontology

Synopsis

The ESPAS data portal manages a vocabulary of Space Physics keywords that can be used to narrow down data searches to observations of specific physical content. Such content-targeted search is provided by ESPAS in addition to the commonly practiced selection by time and location. This document is a user guide to the ESPAS data search capabilities based on the ESPAS Space Physics concepts.

ESPAS Space Physics Ontology is the cornerstone of the data search functions that are specific to ESPAS domain.

Introduction: Data Model versus Domain Ontology

Concepts of Data Model and Ontology are used interchangeably in the eScience community. In ESPAS, we draw a distinction between:

- Data Model: ISO-controlled organization of data elements and their relationships in a generic, science-neutral manner;
- Domain Ontology: a vocabulary-controlled structured set of physical concepts and relationships specific to a particular domain of science.

In order to describe the domain ontology concepts, custom data elements not in the ISO 9100 standard had to be introduced. Additionally, ESPAS Data Model includes new custom data elements of the generic (science-neutral) nature that were required to adequately describe available data collections.

Key Elements of ESPAS Space Physics Ontology

In order to simplify navigation through the wealth of ESPAS Space Physics vocabulary terms, the ontology is organized in several hierarchies of *keywords* connected to each other via a “broader-narrower” relationship. Understanding the ontology hierarchies is critical for efficient data search and discovery in ESPAS.

For a detailed description of the ESPAS Space Physics Ontology click [here](#)

The ESPAS Space Physics Ontology browser provides information for all the vocabularies that constitute the ontology presenting all the terms that exist in each vocabulary along with their description. The hierarchy of the ontology terms is presented in the left column by nesting the “children” terms under the “parent” term.

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1. In order to browse the ESPAS space physics ontology, click on the **Browse → ESPAS Space Physics Ontology** menu item.

The screenshot shows the ESPAS homepage. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE (which is currently selected), ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. On the left, a sidebar titled "ESPAS Metadata" lists features: 1. Metadata search by (Time, Assets, Observed Properties, Observation Collections, Location), 2. Download of Data Files, 3. Download of extracted parameters (Plots of extracted parameters). A mouse cursor is hovering over the "ESPAS Space Physics Ontology" link in the dropdown menu. To the right of the sidebar, there are two boxes: "Search and Download" (describing observations, collections, files or data from a large number of data providers) and "Register" (describing registering data in ESPAS). Below these is a "News / Announcements" box containing a single bullet point about the ESPAS Training School. Further down, there is a section about ESPAS being a data infrastructure for near-Earth space environment observations, models, and predictions, and another section about access to a large number of repositories. At the bottom, there are four icons: NEWS (speech bubble), EVENTS (calendar), PARTNERS (two people), and DATA PROVIDERS (gears). A European Union flag is in the bottom left corner, and a copyright notice for 2012 is in the bottom right.

2. The ontology browser is presented, where you can navigate to all ESPAS space physics vocabularies by clicking on the vocabularies presented in the left column. The hierarchy of the ontology terms is presented in the left column by nesting the “children” terms under the “parent” term, like the windows explorer presents the folders and file structures. By clicking on the name of a vocabulary in the left column, its “children” terms are presented on the left and its definition on the right.

 [LOG IN](#) | [REGISTER](#) | [ESPAS Project](#) | [Contact Us](#)

near earth space data infrastructure for e-science

[HOME](#) [SEARCH](#) **BROWSE** [ESPAS POLICIES](#) [VALUE ADDED SERVICES](#) [SUPPORT](#)

Navigate in ESPAS Space Physics Ontology

Navigate in the ESPAS Space Physics Ontology terms: observed property, phenomenon, measurand, etc.

Start typing to select options...

- ▲ **Observed Property**
 - ▶ Blanketing Frequency
 - ▶ Collision Frequency
 - ▶ Critical Frequency
 - ▶ Cutoff Frequency
 - ▶ Electric Field
 - ▶ Electromagnetic Wave
 - ▶ Electron Density
 - ▶ Electrostatic Wave
 - ▶ Frequency Spread of Echo Trace
 - ▶ Ion Composition
 - ▶ Ion Density
 - ▶ Ion Drift Velocity
 - ▶ Ion Flux
 - ▶ Ion Temperature
 - ▶ Kappa Index of Particle Velocity

Observed Property

Corresponds to a phenomenon associated with the feature of interest for which the observation result provides an estimate of its value. It is the object of the observation (e.g. Temperature, Electron Density). It takes values from the Observed Property controlled vocabulary.

IN THIS SECTION

[ESPAS Metadata](#)

ESPAS Space Physics Ontology

[ESPAS Supporting Vocabularies](#)

3. For example, click on the **Observed Property** vocabulary in the left column, then click the **Critical Frequency**, **O-Mode Critical Frequency** and choose the **F2-layer Critical Frequency** entry. Information about this observed property (e.g. description, related concepts) is presented in the right side.

Navigate in ESPAS Space Physics Ontology

Navigate in the ESPAS Space Physics Ontology terms: observed property, phenomenon, measurand, etc.

Start typing to select options...

- ▲ **Observed Property**
 - ▶ Blanketing Frequency
 - ▶ Collision Frequency
 - ▲ **Critical Frequency**
 - ▲ **O-Mode Critical Frequency**
 - ▶ Auroral (particle) E-layer Critical Frequency
 - ▶ E2-layer Critical Frequency
 - ▶ E-layer Critical Frequency
 - ▶ Es-layer Critical Frequency
 - ▶ F1.5-layer Critical Frequency
 - ▶ F1.5-layer Critical Frequency
 - ▶ F1-layer Critical Frequency
 - ▶ F2-layer Critical Frequency
 - ▶ X-Mode Critical Frequency
 - ▶ Z-Mode Critical Frequency
 - ▶ Cutoff Frequency
 - ▶ Electric Field
 - ▶ Electromagnetic Wave

F2-layer Critical Frequency (foF2)

The ordinary wave critical frequency of the highest stratification in the F region of ionosphere

Identifier

http://ontology.espas-fp7.eu/observedProperty/CriticalFrequency_F2-Layer

Phenomenon(s)

[Electromagnetic Wave](#)

Measurand(s)

[Critical Frequency \(f\)](#)

Interaction(s)

[Reflection \(R\)](#)

Propagation Mode

[Ordinary Wave \(O\)](#)

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[ESPAS Metadata](#)

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4. Note that the links that are presented on the right will point you to the corresponding entries of the ontology browser. In this example, click on the **Electromagnetic Wave** under the Phenomenon title, and the information regarding this term are presented on the right.

The screenshot shows a web-based ontology browser interface. On the left, there is a sidebar titled "Navigate in ESPAS Space Physics Ontology" containing a search bar and a tree view of ontology terms. The tree view includes categories like Pressure, Dummy Deprecated Term, Electron Drift Velocity, Electron Flux, Electron Temperature, International Sunspot Number, LOCATION, Neutral Temperature, and Phenomenon. Under Phenomenon, there are Activity, Field, Particle, Photon, and Wave, with Electromagnetic Wave being the selected node. A vertical scrollbar is visible on the right side of the sidebar area. The main content area on the right displays the details for the selected term. The title "Electromagnetic Wave" is bolded. Below it is a detailed description: "A form of energy transmitted and absorbed by charged particles that exhibits wave-like behavior as it travels through space: its electric and magnetic fields oscillate in phase, perpendicular to each other, perpendicular to direction of energy and wave propagation, and with a fixed ratio of the electric to magnetic intensity". There is also a section titled "IDENTIFIER" with the URL <http://ontology.espas-fp7.eu/phenomenon/ElectromagneticWave>. A vertical scrollbar is also present on the right side of the main content area. The top right corner of the page has a "IN THIS SECTION" sidebar with links to "ESPAS Metadata", "ESPAS Space Physics Ontology" (which is highlighted in blue), and "ESPAS Supporting Vocabularies".

5. Similarly, you can navigate through all the vocabularies of the ESPAS Space Physics Ontology by clicking the appropriate terms in the left column.

1.8.3 ESPAS Supporting Vocabularies

Many of the properties of the concepts of the ESPAS Data Model use values from controlled vocabularies and are referred as “supporting” vocabularies. The terms in these vocabularies are connected to each other via “parent-child” relationships (optional), as in the case of the ESPAS Space Physics Ontology. The definition of each controlled vocabulary is given in the Glossary section (**Browse → Glossary**) of the ESPAS portal.



The screenshot shows the ESPAS portal's glossary page. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has a title "Glossary". A sidebar on the right is titled "IN THIS SECTION" and lists several links: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, **Glossary** (which is highlighted in blue), ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us.

Vocabulary	Description
Acquisition	Corresponds to the process component that interacts with the feature of interest / sampling feature to provide a result. It involves the use of an Instrument which is mounted on a Platform that may have an Operation (for satellites, aircrafts).
Asset	Corresponds to an Instrument or a numerical Model or other software that was used to generate the observation.
Component	For vector properties, it describes which of the three components is provided in the data only in those cases when observation does not specify the vector property in full. Typical components are X, Y, Z. The Component has to be accompanied by a suitable description of the Coordinate Reference System (CRS). It takes values from the Component controlled vocabulary.
Composite Observed Property	Describes the group of simple observed properties whose values are estimated in the course of an observation. It takes values from the Composite Observed Property controlled vocabulary.
Composite Process	Represents the process that consists of more than one components of type Acquisition or Computation.
Compressed Representation	Describes the formalism of compressed representation of voluminous or complex 3D, 2D, and 1D data. Typical examples are spherical harmonics for 2D maps on the sphere, truncated Fourier transforms (harmonics) for diurnal time series, Empirical Orthogonal Functions (EOF). It takes values from the Compressed Representation controlled vocabulary.
Computation	Corresponds to the process component that involves only numerical computation (no instrument is involved), as in the case of Models (e.g. EDAM, SIRMUP) or specific softwares (e.g. ARTIST for the autoscaling of the ionograms).
Computation Type	Describes the type of the Computation process (e.g. Mathematical model, software). It takes values from the Computation Type controlled vocabulary.

The ESPAS supporting vocabularies page provides information for all these vocabularies presenting all the terms that exist in each vocabulary along with their description. The hierarchy of the ontology terms is presented in the left column by nesting the “children” terms under the “parent” term.

1. In order to browse the ESPAS supporting vocabularies, click on the **Browse → ESPAS Supporting Vocabularies** menu item.

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The screenshot shows the ESPAS homepage. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has a blue header bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The BROWSE link is currently active, and a dropdown menu is open, showing "ESPAS Metadata", "ESPAS Space Physics Ontology", and "ESPAS Supporting Vocabularies". To the right of the dropdown, there are two boxes: "Search and Download" (containing text about observations, collections, files or data from a large number of data providers) and "Register" (containing text about registering data in ESPAS). Below these boxes is a section titled "News / Announcements" with a bullet point about the ESPAS Training School. Further down, there is a section about ESPAS being a data infrastructure for near-Earth space environment observations, models, and predictions, followed by a section about access to a large number of repositories. At the bottom of the page, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

2. The vocabularies browser is presented, where you can navigate to all ESPAS supporting vocabularies by clicking the vocabularies presented in the left column. The hierarchy of the terms is presented in the left column by nesting the “children” terms under the “parent” term, like the windows explorer presents the folders and file structures. By clicking on the name of a vocabulary in the left column, its “children” terms are presented on the left and its definition on the right.

The screenshot shows a page titled "Navigate in ESPAS Supporting Vocabularies". At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has a blue header bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The BROWSE link is currently active. On the right side, there is a sidebar titled "IN THIS SECTION" with links for ESPAS Metadata, ESPAS Space Physics Ontology, and ESPAS Supporting Vocabularies. The main content area contains a search bar with placeholder text "Start typing to select options...". A list of vocabulary terms is shown, with "Coordinate Reference System (CRS)" expanded to show its children: Corrected GeoMagnetic, Geocentric Cartesian, Geocentric Equatorial Inertial system for epoch 1950 (cartesian), Geocentric Equatorial Inertial system for epoch 1950 (spherical), Geocentric Equatorial Inertial system for epoch 2000 (cartesian), Geocentric Equatorial Inertial system for epoch 2000 (spherical), and Geocentric Solar Ecliptic. To the right of the vocabulary list, there is a detailed description of the "Coordinate Reference System (CRS)" vocabulary, stating it corresponds to Coordinate Reference Systems (e.g. GSE, GSM, ..) used to describe a vector Component (observed property definition), the location of a Platform and the geographic extent of an Observation. It takes values from the Crs controlled vocabulary.

ESPAS User's Manual

3. For example, click on the **Coordinate Reference System (CRS)** vocabulary in the left column, then click the **Geocentric Spherical** term. The description of this term is presented in the right side.

The screenshot shows a web-based application for navigating supporting vocabularies. On the left, there is a sidebar titled "Navigate in ESPAS Supporting Vocabularies" with a search bar and a tree view of vocabulary categories. The "Coordinate Reference System (CRS)" category is expanded, and the "Geocentric Spherical" term is selected, highlighted with a blue background. To the right, the detailed description of the "Geocentric Spherical (GEO spherical)" term is displayed. The description text is as follows:

Geocentric spherical (also known as Spherical Earth Centred Earth Fixed (ECEF)) in spherical representation (lat, lon, alt) where "alt" is the distance from the Earth center in km. (the mean Earth radius is 6371.2 km)

IDENTIFIER

<http://ontology.espas-fp7.eu/crs/GEOspherical>

IN THIS SECTION

- ESPAS Metadata
- ESPAS Space Physics Ontology
- ESPAS Supporting Vocabularies**

4. Similarly, you can navigate through all the ESPAS supporting vocabularies by clicking the appropriate terms in the left column.

1.9 ESPAS Policies menu

The ESPAS Policies menu provides information regarding the ESPAS policies and the data licenses defined by each ESPAS Data Provider. ESPAS provides open access to metadata and no user registration is required. However, the download of data files and data values requires the following:

- user registration and login to the ESPAS portal
- user agreement to the data licenses as defined by each ESPAS Data Provider

Actually, the ESPAS system integrates policy server software which can enforce rules about which users can access which data sets and after what time period. ESPAS Data Providers can use this to set fine grained, enforced controls on access to their data. However, in practice, ESPAS data providers have so far chosen to use Data Licences, requiring only that users accept the licence terms before downloading data.

1. In order to view information regarding the ESPAS policies, click on the **ESPAS Policies** menu. The ESPAS policies page will open to present the ESPAS policy regarding the access to metadata along with the data licenses of the ESPAS data providers.

The screenshot shows the ESPAS Policies page. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has a heading "ESPAS Policies". Under this heading, there are several sections: "Access to Metadata" (with a note that access is open), "Access to Data" (with a note that users must register), "Data Policies set by Data Providers" (with a note that the system integrates policy server software), and "Data Licences By Data Provider" (with a note that users will be asked to agree to the data providers' licences). Below these sections, there is a list of data providers, each with an expandable section for their licences:

- Belgian Institute for Space Aeronomy (BIRA-IASB)
- EDAM
- EISCAT
- Istituto Nazionale di Geofisica e Vulcanologia
- National Observatory of Athens
- ULEIC

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2. In order to view the specific data license from a specific data provider, click on the name of the data provider. In the example below, you can see the data licenses defined by the National Observatory of Athens (NOA) data provider.

Data Licences By Data Provider

On requesting data, users will be asked to agree to the data providers' licences. Below you can view a list of licences grouped by data provider.

- ▼ Belgian Institute for Space Aeronomy (BIRA-IASB)
- ▼ EDAM
- ▼ EISCAT
- ▼ Istituto Nazionale di Geofisica e Vulcanologia
- ▲ National Observatory of Athens

IRI's Terms of Reference

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NOA's Terms of Reference

The data acquired from this service may be used freely for educational and non-commercial academic research purposes by registered users only. Redistribution of the data is subject to the same conditions of use. A heavy investment of time, effort, expertise, and funds continues to be made to produce, collect, quality control, interpret, and store the data and products available from this service. It is important that the DIAS data suppliers and the service developers are appropriately acknowledged in scientific publications that involve analysis of data obtained from this service, making reference to the following basic citations: Belehaki et al., Space Weather, 4, S12002, doi:10.1029/2006SW000270, 2006; Belehaki et al., JASTP, 67, 1092-1099, 2005; Belehaki et al., Acta Geophysica, 55, 3, doi: 10.2478/s11600-007-0010-x, pp 398-409, 2007

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1.10 Value Added Services menu

The Value Added Services menu provides information about the value added services that are provided by ESPAS portal. These services currently include the “TEC Time Series Plotter” and the “Plotting tool for OGC SWE data files”.

1.10.1 TEC Time Series Plotter

The TEC Time Series Plotter Standalone tool provides a simple but functional user interface to extract time series data from global Total Electron Content (TEC) maps, which are delivered to ESPAS via the SWACI service. The developed service enables the user to do rapid analysis of the TEC based on selected locations and time ranges without knowing the data format of SWACI TEC maps in detail. The outputs of this service are time series plots (in PNG format) as well as the time series data files (JSON).

1. In order to view information about the TEC Time Series Plotter tool, click on the **Value Added Services → TEC Time Series Plotter** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES (which is currently selected), and SUPPORT. The VALUE ADDED SERVICES menu contains two items: "TEC Time Series Plotter" and "Plotting tool for OGC SWE data files". A tooltip for "TEC Time Series Plotter" describes it as a "Plotting tool for OGC SWE data files observations, collections, files or data from a large number of data providers". To the right of the menu, there is a "Register" button with the sub-instruction "your data in ESPAS". Below the menu, there is a "News / Announcements" section with a bullet point about the ESPAS Training School. At the bottom of the page, there are four icons labeled NEWS, EVENTS, PARTNERS, and DATA PROVIDERS.

2. A short description of the TEC Time Series Plotter tool is presented along with download links for different operating systems (Linux, Windows). A documentation is provided with instructions on how to install and use this tool.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo is displayed, followed by the text "near earth space data infrastructure for e-science". The main content area has a header "Value Added Services" which is highlighted with a blue background. Below this, there is a section titled "TEC Time Series Plotter Standalone tool" with a sub-section "by Jens Berdermann and Martin Kriegel, DLR". A detailed description of the tool follows, mentioning it is a prototype for extracting time series data from global TEC maps. Below the description are sections for "Instructions" (a numbered list of steps) and "Downloads" (links to software packages for Linux and Windows). To the right of the main content area, there is a sidebar titled "IN THIS SECTION" containing links to "TEC Time Series Plotter" and "Plotting tool for OGC SWE data files".

TEC Time Series Plotter Standalone tool
by [Jens Berdermann](#) and [Martin Kriegel, DLR](#)

This tool is a prototype of a value added service designed for the ESPAS project. It provides a simple but functional user interface to extract time series data from global total electron content (TEC) maps, which are delivered to ESPAS via the SWACI service. The developed service enables the user to do rapid analysis of the TEC based on selected locations and time ranges without knowing the data format of SWACI TEC maps in detail. The outputs of this service are time series plots (PNG) as well as the time series data files (JSON).

Instructions

1. Simply download the software package for your OS together with the demo data
2. Unpack both packages
3. Read the [\[documentation\]](#)
4. Start the executable and point to the unpacked demo data

Contact: [Martin\[dot\]Kriegel\[at\]dlr\[dot\]de](mailto:Martin[dot]Kriegel[at]dlr[dot]de)

Downloads

- [TEC Time Series Plotter 1.0 for Linux 32bit](#)
- [TEC Time Series Plotter 1.0 for Linux 64bit](#)
- [TEC Time Series Plotter 1.0 for Windows 32bit](#)
- [TEC Time Series Plotter 1.0 for Windows 64bit](#)
- [Demo Data](#)

IN THIS SECTION

[TEC Time Series Plotter](#)
[Plotting tool for OGC SWE data files](#)

1.10.2 Plotting tool for OGC SWE data files

The plotting tool for OGC SWE data files is an IDL code that can be used to plot a time series of a scalar variable contained in an XML file conforming to the OGC SWE Common Data Model Encoding Standard (OGC 08-094r1).

1. In order to view information about the plotting tool for OGC SWE data files, click on the **Value Added Services → Plotting tool for OGC SWE data files** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES (which is currently selected), and SUPPORT. The VALUE ADDED SERVICES menu is expanded, showing options like TEC Time Series Plotter and Plotting tool for OGC SWE data files. A tooltip for the Plotting tool for OGC SWE data files describes it as "observations, collections, files or data from a large number of data providers". To the right of this menu, there is a "Register" button with the sub-instruction "your data in ESPAS". Below the menu, there is a "News / Announcements" section with a bullet point about the ESPAS Training School. Further down, there is a summary of what ESPAS is and a link to access repositories. At the bottom, there are four icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS.

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2. A short description of the plotting tool for OGC SWE data files is presented along with a download link. Instructions are provided on how to use this tool.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is the ESPAS logo and the text "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES (which is highlighted in blue), and SUPPORT. On the left side of the content area, there is a section titled "Plotting tool for OGC SWE data files" by Daniel Heynderickx, DH Consultancy BVBA, Leuven, Belgium. It contains instructions for using the IDL code, which involves downloading the IDL code file, starting an IDL session, and calling the IDL procedure SWEplot, XMLfile where XMLfile is the fully qualified file name of the SWE XML file. It also mentions that the code produces a PNG plot and a CSV dump file with the same base name as the XML file, in the same directory. The contact email is DHConsultancy(at)skynet(dot)be. There is a "Downloads" section with links to IDL Code and Sample demo file. On the right side, there is a sidebar titled "IN THIS SECTION" with links to TEC Time Series Plotter and a button labeled "Plotting tool for OGC SWE data files".

1.11 Support menu

The support menu provides information to the user and the data provider regarding the ESPAS portal and its basic components: the ESPAS Data Model and the ESPAS Space Physics Ontology. It is highly suggested the users and Data Providers of ESPAS to read this material beforehand in order to understand the concepts and terms used in ESPAS portal and how these terms are used for the metadata searches. This will facilitate their interaction with ESPAS portal and maximize their potentials to perform queries for observations that satisfy more complex criteria.

This material is accompanied by the "Glossary" page that gives the definitions for all the terms that are used in the ESPAS portal, and the "Contact" page that offers a contact form with the ESPAS administrator.

1.11.1 About ESPAS

1. In order to view information about ESPAS project, click on the **Support → About ESPAS** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo is displayed, followed by the text "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is currently open, showing options like About ESPAS (which is highlighted with a cursor), ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. The main content area on the left lists services provided by ESPAS, such as Metadata search by Time, Assets, Observed Properties, Observation Collections, Location, Download of Data Files, Download of extracted parameters, and Plots of extracted parameters. The right side features sections for Search and Download, News / Events, and a summary of ESPAS as a data infrastructure. At the bottom, there are links for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with a European Union flag and copyright information.

ESPAS User's Manual

2. The “About ESPAS” page is presented that provides an overview of ESPAS project.

The screenshot shows the ESPAS website with a dark blue header bar. On the left is the ESPAS logo, which consists of a yellow circle with a blue dot inside, followed by the word "espas" in a bold, lowercase, sans-serif font. To the right of the logo are links for "LOG IN" and "REGISTER", separated by a vertical line, followed by "ESPAS Project" and "Contact Us". Below the header is a horizontal navigation bar with links for "HOME", "SEARCH", "BROWSE", "ESPAS POLICIES", "VALUE ADDED SERVICES", and a dark blue button labeled "SUPPORT". To the right of the navigation bar is the text "near earth space data infrastructure for e-science". The main content area has a light gray background. On the left, under the heading "About ESPAS", there is a paragraph of text about the project's diversity and a list of two points. On the right, a sidebar titled "IN THIS SECTION" lists various links: "About ESPAS" (which is highlighted in a dark blue box), "ESPAS Data Model", "ESPAS Space Physics Ontology", "Glossary", "ESPAS User's Manual", "For Data Providers", "Data Providers' Status", and "Contact Us".

About ESPAS

The ESPAS project is building an e-Infrastructure that will help scientists and engineers to locate observational data from ground-based and space borne sensors and from models that can advance studies of the near-Earth space environment, and its adverse impact on advanced technologies. This is a very diverse environment extending from the upper atmosphere, out into the magnetosphere, and beyond into that part of the solar wind that is flowing past the Earth (and that is often depositing significant amounts of energy and momentum into the magnetosphere). This environment has many different components including (a) both the neutral and ionised parts of the upper atmosphere, the [thermosphere](#) and [ionosphere](#) respectively, which extend upwards to around 1000 km altitude, (b) the tenuous extension of the ionosphere out to altitudes of 20000 km (the [plasmasphere](#)), (c) the regions of high-energy particles that surround the Earth (the [radiation belts](#)), and (d) the origins and properties of the hot plasma flowing from the Sun to the Earth (the [solar wind](#)). This diversity creates a tension that ESPAS has sought to resolve:

- a. Data are spread around many institutes, each specialising in a particular measurement or model, but
- b. The modern focus on inter-disciplinary studies (e.g. coupling between different components) means that individual scientists and engineers wish to access many different datasets.

Thus there was a clear need for a system that helps scientists to locate the datasets that they need, and then to download those data. This is the core of the problem that ESPAS has addressed.

The immediate aim was to provide a single-point access to a large number of data repositories covering different aspects of the near-Earth environment. These repositories are very heterogeneous, including data from both ground- and space-based sensors and using a wide variety of measurement techniques, e.g. in-situ and remote sensed measurements. This heterogeneity was important as it provided the challenge needed to develop a truly flexible system. So the ESPAS Consortium has had to address a number of detailed objectives:

- How can the infrastructure integrate heterogeneous data from multiple providers? To do this, we have established a data model that allows us to capture a wide range of metadata about all these data and to do so in a consistent manner. It is the breadth and consistency of the metadata that enables us to build a powerful tool for locating data. For this reason we regard the data model as a key outcome of ESPAS.
- Who can access the data? To build confidence among data providers, the infrastructure regulates access to the data, so that users are made aware of policies on the use of the data, and that, where restrictions on access exist, ESPAS can apply them.
- How to find the data? The infrastructure must make it straightforward for users to locate data using criteria that are suited to the user's scientific objectives, which we may term a "scientist-friendly" approach. To facilitate such searches, a number of workflows have been developed for use within the ESPAS portal.
- Have we tested ESPAS? The infrastructure is being tested through the application of several test and science cases, designed to serve the needs of the wide interdisciplinary users.

1.11.2 ESPAS Data Model

1. In order to view information about ESPAS Data Model, click on the **Support → ESPAS Data Model** menu item.

The screenshot shows the ESPAS website homepage. At the top right, there are links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below these is the text "near earth space data infrastructure for e-science". The main navigation bar includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is open, showing options like About ESPAS, **ESPAS Data Model**, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. A sub-menu for "About ESPAS" is also visible. On the left, there's a sidebar with a list of services: 1. Metadata search by Time, Assets (Instruments and Models), Observed Properties, Observation Collections, Location; 2. Download of Data Files; 3. Download of extracted parameters. Below this is a "Search and Download" section and a "News / Events" section. The footer contains icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with a European Union flag and copyright information.

LOG IN | REGISTER | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT

About ESPAS

ESPAS Data Model

ESPAS Space Physics Ontology

Glossary

ESPAS User's Manual

For Data Providers

Data Providers' Status

Contact Us

ESPAS provides the following services:

1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
2. Download of Data Files
3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download

observations, collections, files or data products from a large number of data providers

News / Events

- The ESPAS Training School will take place in October 2015. See <http://www.espas.eu>

ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

NEWS EVENTS PARTNERS DATA PROVIDERS

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

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2. The “ESPAS Data Model” page provides a general overview of the ESPAS Data Model with a figure that outlines the relationships among the major data model concepts. A link is provided at the end of this page for the detailed documentation of the ESPAS Data Model for an in-depth description.



1.11.3 ESPAS Space Physics Ontology

1. In order to view information about ESPAS Space Physics Ontology, click on the **Support → ESPAS Space Physics Ontology** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is a logo for 'near earth space data infrastructure for e-science'. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is open, displaying a list of options: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology (which is highlighted with a blue background), Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. A news section below the menu lists an event for October 2015. At the bottom of the page, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

ESPAS provides the following services:

1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
2. Download of Data Files
3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download
observations, collections, files or data products from a large number of data providers

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ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

NEWS EVENTS PARTNERS DATA PROVIDERS

The ESPAS Consortium - Copyright 2012
This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

2. The ESPAS Space Physics Ontology page provides a general overview of the ontology that has been developed for ESPAS. A link is provided at the end of this page for the detailed documentation of the ESPAS space physics ontology.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT button is highlighted with a blue background. The central content area features a section titled "ESPAS Space Physics Ontology". Under this title, there is a "Synopsis" section which describes the portal's role in managing a vocabulary of Space Physics keywords. It also mentions the distinction between Data Model and Ontology. A list of bullet points defines these terms. Below this, there is a paragraph about the introduction of custom data elements and the inclusion of new custom data elements. A "Key Elements of ESPAS Space Physics Ontology" section follows, explaining the organization of the ontology into hierarchies of keywords. A callout box at the bottom of this section provides a link for a detailed description of the ontology. On the right side of the page, there is a sidebar titled "IN THIS SECTION" containing links to various sections: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology (which is highlighted with a blue background), Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us.

ESPAS Space Physics Ontology

Synopsis

The ESPAS data portal manages a vocabulary of Space Physics keywords that can be used to narrow down data searches to observations of specific physical content. Such content-targeted search is provided by ESPAS in addition to the commonly practiced selection by time and location. This document is a user guide to the ESPAS data search capabilities based on the ESPAS Space Physics concepts.

ESPAS Space Physics Ontology is the cornerstone of the data search functions that are specific to ESPAS domain.

Introduction: Data Model versus Domain Ontology

Concepts of Data Model and Ontology are used interchangeably in the eScience community. In ESPAS, we draw a distinction between:

- Data Model: ISO-controlled organization of data elements and their relationships in a generic, science-neutral manner;
- Domain Ontology: a vocabulary-controlled structured set of physical concepts and relationships specific to a particular domain of science.

In order to describe the domain ontology concepts, custom data elements not in the ISO 9100 standard had to be introduced. Additionally, ESPAS Data Model includes new custom data elements of the generic (science-neutral) nature that were required to adequately describe available data collections.

Key Elements of ESPAS Space Physics Ontology

In order to simplify navigation through the wealth of ESPAS Space Physics vocabulary terms, the ontology is organized in several hierarchies of keywords connected to each other via a "broader-narrower" relationship. Understanding the ontology hierarchies is critical for efficient data search and discovery in ESPAS.

For a detailed description of the ESPAS Space Physics Ontology click [here](#)

1.11.4 Glossary

1. In order to view the ESPAS Glossary, click on the **Support → Glossary** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is a header with the text "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is currently open, displaying a list of options: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary (which is highlighted with a blue background), ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. On the left side of the page, there is a sidebar with the heading "ESPAS provides the following services:" followed by a numbered list. The main content area contains sections for "Search and Download" and "News / Events". At the bottom of the page, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS. The European Union flag is visible in the bottom left corner, and a copyright notice at the bottom right states: "The ESPAS Consortium - Copyright 2012. This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676."

ESPAS User's Manual

2. The “Glossary” page provides a list of terms and their definition that are used in the ESPAS portal.



The screenshot shows the ESPAS portal's homepage with a navigation bar at the top. The navigation bar includes links for LOG IN, REGISTER, ESPAS Project, Contact Us, HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT link is highlighted in a blue box. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. On the left, there is a large yellow circular logo with a blue dot in the center, followed by the word "espas" in blue lowercase letters. A sidebar on the right is titled "IN THIS SECTION" and lists several links: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, **Glossary** (which is also highlighted in a blue box), ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us.

Glossary

Acquisition	Corresponds to the process component that interacts with the feature of interest / sampling feature to provide a result. It involves the use of an Instrument which is mounted on a Platform that may have an Operation (for satellites, aircrafts).
Asset	Corresponds to an Instrument or a numerical Model or other software that was used to generate the observation.
Component	For vector properties, it describes which of the three components is provided in the data only in those cases when observation does not specify the vector property in full. Typical components are X, Y, Z. The Component has to be accompanied by a suitable description of the Coordinate Reference System (CRS). It takes values from the Component controlled vocabulary.
Composite Observed Property	Describes the group of simple observed properties whose values are estimated in the course of an observation. It takes values from the Composite Observed Property controlled vocabulary.
Composite Process	Represents the process that consists of more than one components of type Acquisition or Computation.
Compressed Representation	Describes the formalism of compressed representation of voluminous or complex 3D, 2D, and 1D data. Typical examples are spherical harmonics for 2D maps on the sphere, truncated Fourier transforms (harmonics) for diurnal time series, Empirical Orthogonal Functions (EOF). It takes values from the Compressed Representation controlled vocabulary.
Computation	Corresponds to the process component that involves only numerical computation (no instrument is involved), as in the case of Models (e.g. EDAM, SIRMUP) or specific softwares (e.g. ARTIST for the autoscaling of the ionograms).
Computation Type	Describes the type of the Computation process (e.g. Mathematical model, software). It takes values from the Computation Type controlled vocabulary.

1.11.5 ESPAS User's Manual

1. In order to view the ESPAS User's Manual, click on the **Support → ESPAS User's Manual** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is open, showing options like About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, and ESPAS User's Manual (which is highlighted with a blue background). Other menu items include For Data Providers, Data Providers' Status, and Contact Us. Below the menu, there is a section titled "Search and Download" and another titled "News /". A footer at the bottom contains icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

ESPAS provides the following services:

1. Metadata search by
 - Time
 - Assets (Instruments and Models)
 - Observed Properties
 - Observation Collections
 - Location
2. Download of Data Files
3. Download of extracted parameters
 - Plots of extracted parameters

Search and Download
observations, collections, files or data products can be searched and downloaded from a large number of data providers.

News /
• The ESPAS Training School will take place in Paris, France, 12–16 October 2015. See <http://www.espas.eu/training-school>

ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.
Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

NEWS **EVENTS** **PARTNERS** **DATA PROVIDERS**

The ESPAS Consortium - Copyright 2012
This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

ESPAS User's Manual

2. The “ESPAS User's Manual” page provides information about the ESPAS User's Manual.

The screenshot shows the ESPAS User's Manual page. At the top is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is a header with the ESPAS logo and the text "near earth space data infrastructure for e-science". The main content area has a title "ESPAS User's Manual" and a detailed description of the portal's purpose and services. It lists four service categories: 1. Metadata search, 2. Download of data files, 3. Download of data values (extracted parameters), and 4. Plot of the data values. A note states that user registration and login are required for these services. A callout box at the bottom left provides a link to the PDF version of the manual. On the right side, there is a sidebar titled "IN THIS SECTION" with links to various sections like About ESPAS, Data Model, Space Physics, Ontology, Glossary, and the current page, "ESPAS User's Manual". There are also links for Data Providers, Status, and Contact Us.

ESPAS User's Manual

ESPAS is a data e-infrastructure facilitating access to observations and model predictions of the near-Earth space environment, a region extending from the Earth's atmosphere up to the outer radiation belts. Through the ESPAS portal the user can have access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors. The user can perform searches for observations using specific criteria (e.g. time, instrument) and then (s)he can download data files or data values.

More precisely, the ESPAS portal provides the following services to the user:

1. **Metadata search** for observations that satisfy the following specific criteria:
 - Time period: the time period when the observations were acquired
 - Assets: the Instruments and Models that were used for the generation of the observations
 - Observed properties: the observed properties that were measured in the observations
 - Observation collections: the collections that the observations belong to
 - Location: the location of the platforms (ground-based observatories or satellites) on which the instruments are mounted and used for the generation of the observations

The metadata search is open to all users with no registration required.

2. **Download of data files**: The result of a metadata search is a list of the observation collections (that contain the observations) that satisfy the query criteria. Then, the user can proceed to download data files originating to the ESPAS data providers. The data files are provided in the original format as defined by each ESPAS data provider. Note that user registration and login to ESPAS portal is required for this service.
3. **Download of data values (extracted parameters)**: The result of a metadata search is a list of the observation collections (that contain the observations) that satisfy the query criteria. Then, the user can request to download data values from specific observed properties, as extracted from the data files. A subset of the observed properties is available for download as extracted data values. After a data value download request, the user gets as a result a text file (csv or XML format) that contains the values of the selected observed properties. At this stage, the following service is also available to the user:
 - Plot of the data values: After a data value download request, the user can view or download a linear plot that presents the values of the selected observed properties versus time.

Note that user registration and login to ESPAS portal is required for these services.

A detailed description of the ESPAS Portal and instructions on how to use it are provided at the ESPAS User's Manual. Click [here](#) for the PDF version.

IN THIS SECTION

About ESPAS
ESPAS Data Model
ESPAS Space Physics
Ontology
Glossary
ESPAS User's Manual
For Data Providers
Data Providers' Status
Contact Us

1.11.6 For Data Providers

1. In order to view the information for the data providers, click on the **Support → For Data Providers** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is open, showing options like About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, and For Data Providers. The "For Data Providers" option is highlighted with a blue background and white text. A news box is visible in the center, and a footer section at the bottom left contains icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

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2. The “For Data Providers” page is addressed to both the existing ESPAS Data Providers and the new ones wishing to participate in the ESPAS. It presents all the relevant information of the required steps to be performed by a data provider in order a dataset to be registered in ESPAS portal.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOGIN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is a logo for 'near earth space data infrastructure for e-Science'. The main content area has a sub-navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT link is highlighted with a blue background. The main content area contains a section titled 'For Data Providers'. This section includes a brief summary of the steps required to include a dataset in ESPAS, followed by two detailed sections: 'Describe your data' and 'Create XML entities according to the data model'. A sidebar on the right, titled 'IN THIS SECTION', lists various links such as About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. A video player is also visible in the bottom left corner of the main content area.

1.11.7 Data Providers' Status

- In order to view information about the Data Providers' status, click on the **Support → Data Providers' Status** menu item.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar is the ESPAS logo and the text "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. The SUPPORT menu is open, showing options like About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, and Data Providers' Status (which is highlighted with a mouse cursor). Below the main menu, there are sections for Search and Download, News / Events, and Partners. At the bottom, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

ESPAS provides the following services:

1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
2. Download of Data Files
3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download
observations, collections, files or data products from a large number of data providers

News / Events
• The ESPAS Training School will take place in Paris, France, 12–16 October 2015. See <http://www.espas.eu/training-school>

ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

DATA PROVIDERS

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

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2. The “Data Providers Status” page provides a list of all the ESPAS Data Providers and their status regarding their online availability (online/offline). The green tick (✓) implies that the Data Provider is online and ready to accept requests for download of data files and data values. The red mark (✗) implies that the Data Provider is currently not available. This means that the requests for dataset files (see section 3 “Download of Data Files: Examples”) will be processed as soon as the provider becomes available whereas requests for data values (see section 4 “Download of Data Values: Examples”) will not be processed. The date of the last update of the status is also presented at the right column.

The screenshot shows the ESPAS homepage with the navigation bar: LOG IN | REGISTER | ESPAS Project | Contact Us. Below the navigation is the tagline: near earth space data infrastructure for e-science. The main content area has a heading: Data Providers' Status. A sub-instruction: View a list of all the ESPAS Data Providers and their status (online/offline). A table lists 15 data providers with their names, status (green checkmark or red X), and last update date. The table is as follows:

#	Data Provider's Name	Status	Last Update Date
1	ADP	✗	2015-08-06 02:00:13
2	Belgian Institute for Space Aeronomy (BIRA-IASB)	✓	2015-08-06 02:00:01
3	Bla Bla	✗	2015-08-05 12:45:24
4	Bla Bla	✓	2015-08-06 02:00:15
5	Demo Account	✗	2015-08-03 16:15:10
6	Demo Account	✓	2015-08-06 02:00:00
7	DH Consultancy	✗	2015-08-06 02:00:13
8	DLR	✗	2015-08-05 17:00:32
9	DLR	✓	2015-08-06 02:00:12
10	DTU Space	✗	2015-08-06 01:45:11
11	DTU Space	✓	2015-08-06 02:00:01
12	EDAM	✗	2015-08-05 17:00:42
13	EDAM	✓	2015-08-06 02:00:12
14	EISCAT	✗	2015-08-02 02:47:01
15	EISCAT	✓	2015-08-06 02:00:13

On the right side, there is a sidebar titled "IN THIS SECTION" with links: About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status (which is highlighted in blue), and Contact Us.

1.11.8 Contact Us

1. In order to contact ESPAS administrator, click on the **Support → Contact Us** menu item or the **Contact Us** link in the top right menu bar.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. A dropdown menu is open under the SUPPORT link, listing options such as About ESPAS, ESPAS Data Model, ESPAS Space Physics Ontology, Glossary, ESPAS User's Manual, For Data Providers, Data Providers' Status, and Contact Us. The Contact Us option is highlighted with a blue background and a cursor arrow pointing to it. On the left side of the page, there is a sidebar with text about services provided by ESPAS, including metadata search, download of data files, and extracted parameters. Below the sidebar, there is a section about the ESPAS Training School. At the bottom of the page, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

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2. Provide the required information and the message you want to send to ESPAS administrator and click **Submit**. Note that the fields marked with an asterisk (*) are mandatory.

The screenshot shows the ESPAS website interface. At the top, there is a navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT (which is highlighted in blue), and MY ACCOUNT. The main content area has a heading 'Contact Us' and instructions: 'Send an email to the system administrator. All fields with an * are required.' Below this are four input fields: 'Name (*)' with value 'Anna Charisi', 'E-mail Address (*)' with value 'annacharisi@yahoo.com', 'Subject (*)' with value 'Interest on participating in ESPAS as Data Provider', and a larger 'Message (*)' field containing a message about becoming a Data Provider. A 'Submit' button is at the bottom of the form. To the right of the form is a sidebar titled 'IN THIS SECTION' with links to various ESPAS documentation and resources. At the bottom of the page are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, along with the European Union flag and copyright information.

3. A message is presented that confirms that your email was successfully sent to the ESPAS administrator.

Email to administrator was successfully sent

1.12 My Account menu

The **My Account** menu provides information regarding the user's personal information, the dataset files download requests, the data values download requests and location searches requests. Moreover, for the users that are registered as data providers in the ESPAS portal, there are two extra options in this menu: the register data provider and manage data source (see Support → For Data Providers for more information). The **My Account** menu is displayed only after you have logged in the ESPAS Portal.

1.12.1 My Personal Information

1. If you want to edit your personal information (e.g. password, name), click **My Account** → **My Personal Info** from the main menu.

The screenshot shows the ESPAS portal homepage. At the top, there is a navigation bar with links: Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us. Below the navigation bar is the ESPAS logo and the tagline "near earth space data infrastructure for e-science". The main menu includes links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The MY ACCOUNT link is highlighted. A dropdown menu for "My Personal Info" is open, showing sub-options: My Personal Info (selected), My Dataset File Downloads, My Data Values Downloads, and My Location Searches. On the left, there is a sidebar with text about services and a list of items. In the center, there is a "Search and Download" section and a "News / Announcements" section. At the bottom, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS.

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2. Update your personal information (name, password, organisation name, domain, country, the intended use of ESPAS data, comments) and click **Submit**. Note that the fields marked with an asterisk (*) are mandatory. If you wish to become an ESPAS data provider, you have first to contact the ESPAS administrator via the “Contact Us” page, and then to check the box “Check if you are a data provider administrator” upon registration. The ESPAS administrator will review your request and upgrade your user status to become a data provider. As a data provider you can register metadata in the ESPAS portal.

The screenshot shows the 'Edit your information' section of the ESPAS User Profile. It includes fields for Name, E-mail Address, Password, Confirm Password, Organisation Name, Domain, and Country. There are also sections for 'Intended use of ESPAS data' (Academic selected), 'Comments', and a 'Data Provider' checkbox. A sidebar on the right lists 'IN THIS SECTION' links: My Personal Info, My Dataset File Downloads, My Data Values Downloads, and My Location Searches. A success message at the bottom states: 'Success! Your information was updated successfully.'

Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT MY ACCOUNT

Edit your information

Name (*) Anna Charisi

E-mail Address (*) annacharisi@yahoo.com

Password (Optional) *****

Confirm Password (Optional) *****

Affiliation

Organisation Name (*) UOA

Domain (*) Academic / Research

Country (*) Greece

Intended use of ESPAS data (*) Academic Commercial

Comments

Data Provider Check if you are a data provider administrator

Submit

IN THIS SECTION

My Personal Info

My Dataset File Downloads

My Data Values Downloads

My Location Searches

Success! Your information was updated successfully.

3. A message is presented that confirms that your personal information has been updated successfully.

1.12.2 My Dataset File Downloads

The “My Dataset File Downloads” page presents the history and detailed information of your download requests (for dataset files). Note that for each completed download request you will be provided with a link to download the data files. This download link is valid for a specific period of time, as defined by each ESPAS Data Provider. Afterwards, the request is expired and you cannot download the data files.

For each download request you can:

- view its status: A request is characterized by its status, which can have one of the following values:
 - Submitting: the request is being submitted to the ESPAS system. You should wait until the status becomes “Completed” to get the data files.
 - Running: the request is running. You should wait until the status becomes “Completed” to get the data files.
 - Completed: the request has been completed successfully. The status report provides you with a link to download the data files. This link is valid for a specific period of time, as defined by each ESPAS data provider that is also included in the status report. Afterwards, the request is expired and you cannot download the data files.
 - Pending: the request is in a pending state and an appropriate message is displayed. You should wait until the status becomes “Completed”.
 - Expired: the request has expired. The url to download the data files is not available any more. You can resubmit the request to ask for the files again.
 - Canceled: the request has been canceled by the user. You can resubmit the request.
 - Failed: the request has failed and the reason of failure is reported. You can resubmit the request.
 - Undefined: The request is in undefined status. You should contact the ESPAS administrator (Home Page → Contact Us).
- refresh the status: You can refresh the status of a request that is in submitting, pending or running status.
- cancel the request: You can cancel a request that is in submitting, pending or running status.
- resubmit the request: You can resubmit a request that is in expired, failed or canceled status.
- view search results: You can view the search results of the request (opens in a

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new window).

1. In order to view the history of your dataset file download requests, click **My Account → My Dataset File Downloads** from the main menu.

The screenshot shows the ESPAS homepage. At the top right, there are links for "Hello, Anna Charisi", "Sign Out", "ESPAS Project", and "Contact Us". Below this is the text "near earth space data infrastructure for e-science". The navigation bar includes "HOME", "SEARCH", "BROWSE", "ESPAS POLICIES", "VALUE ADDED SERVICES", "SUPPORT", and "MY ACCOUNT". A dropdown menu from "MY ACCOUNT" contains "My Personal Info", "My Dataset File Downloads" (which is highlighted with a blue box and a cursor arrow), "My Data Values Downloads", and "My Location Searches". On the left, a sidebar lists services: 1. Metadata search by (Time, Assets, Observed Properties, Observation Collections, Location), 2. Download of Data Files, 3. Download of extracted parameters (Plots of extracted parameters). In the center, a "Search and Download" box says "observations, collections, files or data from a large number of data providers". To the right, a "News / Announcements" box mentions the ESPAS Training School in Warsaw. At the bottom, it states "Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors."

2. A list of all your download requests is presented in chronological order (oldest first). The name of the request is the name you have defined during the submission of the request (see also section 3: Download of data files). Inside the parenthesis the local time of the submission is presented. You can sort the requests by submission date, name or status by clicking on the appropriate option of the **Sort by** drop down menu (1) in ascending or descending order (2). Moreover, you can use the search box “filter” (3) to search for requests with a specific name, date or status.

The screenshot shows the "My Dataset File Downloads" page. At the top right, there are links for "Hello, Anna Charisi", "Sign Out", "ESPAS Project", and "Contact Us". Below this is the text "near earth space data infrastructure for e-science". The navigation bar includes "HOME", "SEARCH", "BROWSE", "ESPAS POLICIES", "VALUE ADDED SERVICES", "SUPPORT", and "MY ACCOUNT". On the right, a sidebar titled "IN THIS SECTION" lists "My Personal Info", "My Dataset File Downloads" (which is highlighted with a dark blue box), "My Data Values Downloads", and "My Location Searches". The main content area has a heading "My Dataset File Downloads" and a sub-instruction: "Check out your download requests. They have a time stamp of the request. Just click on a request to see its progress, information about it, and a list of download URLs if it is completed." It features three red boxes numbered 1, 2, and 3: 1 points to a "Sort by Date" dropdown, 2 points to an "Order by Descending" dropdown, and 3 points to a "Filter..." input field. Below these are four download entries:

- Electron Density Maps (20th June 2014) (2015-08-10 23:58:09) - COMPLETED
- Athenes SAO files - UCL FPIs (2015-08-10 01:32:26) - COMPLETED
- Whisper 1 - Feb 2001 (2015-08-10 01:29:27) - CANCELED
- (2015-08-04 10:54:39) - COMPLETED

3. If you want to check the status of a download request or view more information about it, click on the name of a specific request. In the following example the information about the download request with name: "Athens SAO files – UCL FPIs" that was submitted on 2015-08-10 01:32:26 (local time) is presented.

The status of the request is shown (1) (which is "completed" in this example) along with the expiration date (2) (See also the section 1.12.2 for a description of the possible status values). Then, the download link (3) is provided, one for each ESPAS Data Provider. Click on the link(s) to download the data files. Note that the download link(s) is valid until the expiration date (2). Afterwards, the request is expired and you cannot download the data files. You can resubmit the request to get the same data files.

On the right (4), there is the button to view the search results of the request.

At the bottom (5) the query options of the request are presented. In this example, the query options of the request are "*Observation Collections = Athens Digisonde SAO files (autoscaled), UCL FPIs Wind and Intensity Files AND Time Periods = 2013-01-01 00:00:00 - 2013-01-02 23:10:00 00:00 - 23:59 UTC*".

The screenshot shows a web page with the following details:

- Header:** Shows the title "Athens SAO files - UCL FPIs (2015-08-10 01:32:26)" and a status indicator "COMPLETED".
- Section 1:** A red box highlights the status message: "COMPLETED [Download requests have been successfully received and processed by the associated data providers.]".
- Section 2:** A red box highlights the expiration date: "Expiration Date - 2015-09-14 01:34:30". Below it, provider information is listed: "Provider - National Observatory of Athens" and "Expiration Date - 2015-09-14 01:34:30".
- Section 3:** A red box highlights the download link: "Click here to download the files from National Observatory of Athens".
- Section 4:** A red box highlights a group of four buttons: "Refresh Status", "Cancel Request", "Resubmit Request", and "View Search Results".
- Section 5:** A red box highlights the "Query Options" section at the bottom. It displays the "Observation Collections" as "Athens Digisonde SAO files (autoscaled), UCL FPIs Wind and Intensity Files" and the "Time Periods" as "2013-01-01 00:00:00 - 2013-01-02 23:10:00 00:00 - 23:59 UTC".

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4. In the following example, a request that has been canceled by the user is presented (Canceled status). You can resubmit the request or view the search results by clicking on the appropriate buttons presented on the right.

The screenshot shows a search result for a download request. At the top left is the title '^ Whisper 1 - Feb 2001 (2015-08-10 01:29:27)'. At the top right is the status 'CANCELED'. Below the title, there is a 'CANCELED' message with a note '[Download request has been canceled by user.]'. The expiration date is listed as 'Expiration Date - 2015-09-09 01:29:27'. A 'Provider' section indicates 'Provider - Belgian Institute for Space Aeronomy (BIRA-IASB)' and a 'CANCELED' message with the same note. On the right side, there are four buttons: 'Refresh Status', 'Cancel Request', 'Resubmit Request', and 'View Search Results'. Below these buttons is a 'Query Options' section with 'Observation Collections WHISPER1 Electron Density' and 'Time Periods 2001-02-04 10:45:00 - 2001-02-10 23:59:00 00:00 - 23:59 UTC'.

5. In the following example, a request that is in a pending state is presented (pending status). This happens, for example when the download request is being processed. You should wait until the status becomes "Completed" to get the data files. You can refresh the status, cancel the request or view the search results by clicking on the appropriate buttons presented on the right.

The screenshot shows a search result for a download request. At the top left is the title '^ Electron Density Maps (20th June 2014) (2015-08-10 23:58:09)'. At the top right is the status 'PENDING'. Below the title, there is a 'PENDING' message with a note '[Download request is being processed]'. The expiration date is listed as 'Expiration Date - 2015-09-09 23:58:09'. A 'Provider' section indicates 'Provider - National Observatory of Athens' and a 'SUBMITTING' message. On the right side, there are four buttons: 'Refresh Status', 'Cancel Request', 'Resubmit Request', and 'View Search Results'. Below these buttons is a 'Query Options' section with 'Observation Collections DIAS Topside Electron Density Nowcasting Maps' and 'Time Periods 2014-06-20 00:00:00 - 2014-06-20 22:30:00 00:00 - 23:59 UTC'.

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6. In the following example, a request that is running (running status) is presented. You should wait until the status becomes “Completed” to get the data files. You can refresh the status, cancel the request or view the search results by clicking on the appropriate buttons presented on the right.

^ Whisper 1 - Feb 2001 (2015-08-10 01:29:27) RUNNING

RUNNING [Processing of download request has started. Associated providers will be contacted to process the specified request.]

Expiration Date - 2015-09-09 01:29:27

Provider - Belgian Institute for Space Aeronomy (BIRA-IASB)
SUBMITTING

Refresh Status
Cancel Request
Resubmit Request
View Search Results

Query Options
Observation Collections WHISPER1 Electron Density
Time Periods 2001-02-04 10:45:00 - 2001-02-10 23:59:00 00:00 - 23:59 UTC

1.12.3 My Data Values Downloads

The “My Data Values Downloads” page presents the history and detailed information of your download requests (for data values). Note that for each completed download request you will be provided with the option to view/download the data values (in ASCII or XML format) or to plot them. These functionalities are valid for a specific period of time, as defined by each ESPAS data provider. Afterwards, the request is expired and you cannot view/download/plot the data values.

For each download request you can:

- view its status: A request is characterized by its status, which can have one of the following values:
 - Submitting: the request is being submitted to the ESPAS system. You should wait until the status becomes “Completed” to get the data values.
 - Running: the request is running. You should wait until the status becomes “Completed” to get the data values.
 - Completed: the request has been completed successfully. You are provided with the option to view/download the data values (in ASCII or XML format) or to plot them. These functionalities are valid for a specific period of time, as defined by each ESPAS data provider. Afterwards, the request is expired and you cannot view/download/plot the data values.
 - Pending: the request is in a pending state and an appropriate message is displayed. You should wait until the status becomes “Completed”.
 - Expired: the request has expired. The url to download the data files is not available any more. You can resubmit the request to get the files again.
 - Failed: the request has failed and the reason of failure is presented. You can resubmit the request.
 - Unknown: The request is in unknown status. You may contact the ESPAS administrator (Home Page → Contact Us) for more information.
- refresh the status: You can refresh the status of a request that is in submitting, pending or running status.
- resubmit the request: You can resubmit a request that has expired or failed.
- view search results: You can view the search results of the request (opens in a new window).

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1. In order to view the history of your data values download requests, click **My Account → My Data Values Downloads** from the main menu.

The screenshot shows the ESPAS homepage with the 'My Account' menu open. The 'My Data Values Downloads' option is highlighted with a blue box and a cursor icon. Other options in the dropdown include 'My Personal Info', 'My Dataset File Downloads', 'My Location Searches', and 'My Data Values Downloads' (which is also listed in the main menu bar).

2. A list of all your download requests is presented in chronological order (oldest first). The name of the request is the name you have defined during the submission of the request (see also section 4: Download of data values). Inside the parenthesis the local time of the submission is presented. You can sort the requests by submission date, name or status by clicking on the appropriate option of the **Sort by** drop down menu (1) in ascending or descending order (2). Moreover, you can use the search box “filter” (3) to search for requests with a specific name, date or status.

The screenshot shows the 'My Data Values Downloads' page. A search bar (3) is highlighted with a red box. Two dropdown menus (1 and 2) for sorting by 'Date' and 'Descending' are also highlighted with red boxes. The page lists three download requests:

Request Name	Date	Status
Athens Digisonde - May 2006 (2015-08-04 14:35:36)	2015-08-04 14:35:36	COMPLETED
Athens Digisonde foF2 (2015-08-04 13:16:44)	2015-08-04 13:16:44	COMPLETED
foF2, fmin, h'f2 (2015-08-04 11:34:45)	2015-08-04 11:34:45	COMPLETED

A sidebar on the right titled 'IN THIS SECTION' includes links to 'My Personal Info', 'My Dataset File Downloads', 'My Data Values Downloads' (which is highlighted with a blue box), and 'My Location Searches'.

3. If you want to check the status of a download request or view more information about it, click on the name of the specific request. In the following example the information about the download request with name: "Athens Digisonde foF2" that was submitted on 2015-08-04 13:16:44 (local time) is presented.

The status of the request is shown (1) (which is "completed" in this example) along with the expiration date (2) (See also the section 1.12.3 for a description of the possible status values). Then, there is the **Get Data as** drop down menu (3) that provides access to the data values (ascii and xml format) and also the **Get Plot Data as** drop down menu (4) that provides a plot of the data values. Note that these menus are valid until the expiration date (2). Afterwards, the request is expired and you cannot view/download/plot the data values. You can resubmit the request to get the data values.

On the right (5) there is the button to view the search results of the request.

At the bottom (6) the query options of the request are presented. In this example, the query options of the request are "*Observation Collections = Athens Digisonde SAO files (autoscaled) AND Time Periods = 2006-05-10 19:00:00 - 2006-05-15 14:14:00 00:00 - 23:59 UTC AND Selected Observed Properties ='F2-layer Critical Frequency'*".

The screenshot shows a web-based interface for managing download requests. At the top, the request name is 'Athens Digisonde foF2 (2015-08-04 13:16:44)' and its status is 'COMPLETED'. Below this, several interface elements are numbered:

- 1**: A red box highlights the status message 'COMPLETED [Processing of sos request has completed]'. To the right, there are buttons for 'Refresh Status' and 'Resubmit Request'.
- 2**: A red box highlights the 'Expiration Date - 2015-09-03 23:07:27'.
- 3**: A red box highlights the 'Get Data as' dropdown menu.
- 4**: A red box highlights the 'Get Plot Data as' dropdown menu.
- 5**: A red box highlights the 'View Search Results' button.
- 6**: A large red box highlights the 'Query Options' section, which displays the following details:
 - Observation Collections**: Athens Digisonde SAO files (autoscaled)
 - Time Periods**: 2006-05-10 19:00:00 - 2006-05-15 14:14:00 00:00 - 23:59 UTC
 - Selected Observed Properties**: F2-layer Critical Frequency

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4. In order to view/download the data values in Ascii format, click the **Ascii** option of the **Get Data as** drop down menu.

The screenshot shows a web interface for a completed SOS request. At the top, it says '^ Athens Digisonde foF2 (2015-08-04 13:16:44)' and 'COMPLETED'. Below that, it says 'Expiration Date - 2015-09-03 23:07:27'. On the right, there are three buttons: 'Refresh Status', 'Resubmit Request', and 'View Search Results'. In the center, there are two dropdown menus: 'Get Data as' (with 'Ascii' selected) and 'Get Plot Data as'. A tooltip for 'Ascii' indicates 'Athens Digisonde SAO files (autoscaled)'. Below these, it says 'Time Periods 2006-05-10 19:00:00 - 2006-05-15 14:14:00 00:00 - 23:59 UTC' and 'Selected Observed Properties F2-layer Critical Frequency'.

5. The data values (marked by a timestamp) are presented in a new tab/window of your browser in ascii format as comma separated values. The header line of the file is the description of the fields of the data values. So, the first value corresponds to the time stamp (in UTC) of the measured observed property, while the second value is the name of the data provider. Afterwards, the extracted data values of measured observed properties are presented in the order defined by the header line. The data values are grouped by data provider and extracted parameter. You can use the "Save Page as" of your browser to save this file locally on your computer.

The screenshot shows a Mozilla Firefox browser window. The address bar has two tabs: 'https://w...scii_csv' and 'ESPAS - My Acco...'. The main content area displays a large block of comma-separated data. The data starts with a header line: '%Phenomenon Time ,Provider Name ,foF2 http://ontology.espas-fp7.eu/unit/MHz (MHz);'. Following this, there are numerous lines of data, each starting with a timestamp like '2006-05-10T19:15:00Z' and ending with a value like '5.7;'. The data is grouped by provider (National Observatory of Athens) and property (F2-layer Critical Frequency).

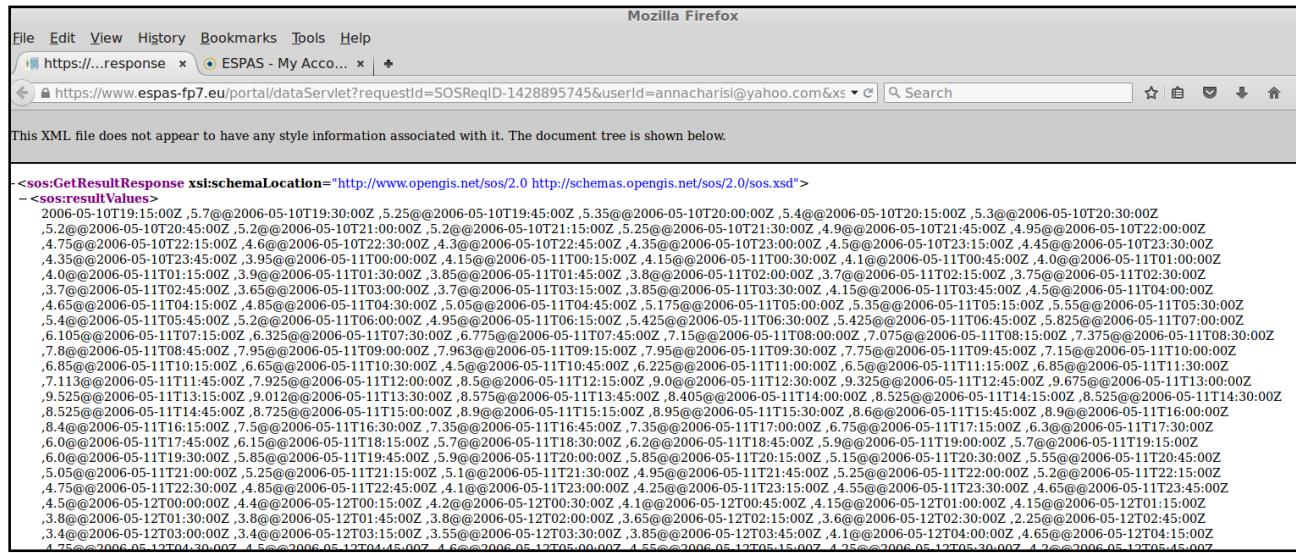
Time	Provider Name	foF2 (MHz)
2006-05-10T19:15:00Z	National Observatory of Athens	5.7;
2006-05-10T19:30:00Z	National Observatory of Athens	5.25;
2006-05-10T19:45:00Z	National Observatory of Athens	5.35;
2006-05-10T20:00:00Z	National Observatory of Athens	5.4;
2006-05-10T20:15:00Z	National Observatory of Athens	5.3;
2006-05-10T20:30:00Z	National Observatory of Athens	5.2;
2006-05-10T20:45:00Z	National Observatory of Athens	5.2;
2006-05-10T21:00:00Z	National Observatory of Athens	5.2;
2006-05-10T21:15:00Z	National Observatory of Athens	5.25;
2006-05-10T21:30:00Z	National Observatory of Athens	4.9;
2006-05-10T21:45:00Z	National Observatory of Athens	4.95;
2006-05-10T22:00:00Z	National Observatory of Athens	4.75;
2006-05-10T22:15:00Z	National Observatory of Athens	4.6;
2006-05-10T22:30:00Z	National Observatory of Athens	4.3;
2006-05-10T22:45:00Z	National Observatory of Athens	4.35;
2006-05-10T23:00:00Z	National Observatory of Athens	4.5;
2006-05-10T23:15:00Z	National Observatory of Athens	4.45;
2006-05-10T23:30:00Z	National Observatory of Athens	4.35;
2006-05-10T23:45:00Z	National Observatory of Athens	3.95;
2006-05-11T00:00:00Z	National Observatory of Athens	4.15;
2006-05-11T00:15:00Z	National Observatory of Athens	4.15;
2006-05-11T00:30:00Z	National Observatory of Athens	4.1;
2006-05-11T00:45:00Z	National Observatory of Athens	4.0;
2006-05-11T01:00:00Z	National Observatory of Athens	4.0;
2006-05-11T01:15:00Z	National Observatory of Athens	3.9;
2006-05-11T01:30:00Z	National Observatory of Athens	3.85;
2006-05-11T01:45:00Z	National Observatory of Athens	3.8;
2006-05-11T02:00:00Z	National Observatory of Athens	3.7;

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6. Regarding the XML format of the data values, there are two option available: the SOS – Result and the SOS – SWE format. In order to view/download the data values in the SOS – Result format, click the **SOS-Result (XML)** option of the **Get Data as** drop down menu.



7. The data values are presented in a new tab/window of your browser in the XML format that corresponds to the SOS response. You can use the “Save Page as” of your browser to save this file locally on your computer.



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8. In order to view/download the data values in the SOS – SWE format, click the **SOS-SWE (XML)** option of the **Get Data as** drop down menu.



9. The data values are presented in a new tab/window of your browser in the XML format that corresponds to the SOS response in SWE format. You can use the “Save Page as” of your browser to save this file locally on your computer.

This screenshot shows a Mozilla Firefox browser window with the title bar 'Mozilla Firefox'. The address bar shows the URL 'https://www.espas-fp7.eu/portal/dataServlet?requestId=SOSReqID-1428895745&userId=annacharisi@yahoo.com&sx'. The main content area displays an XML document. A message at the top says, 'This XML file does not appear to have any style information associated with it. The document tree is shown below.' The XML code is as follows:

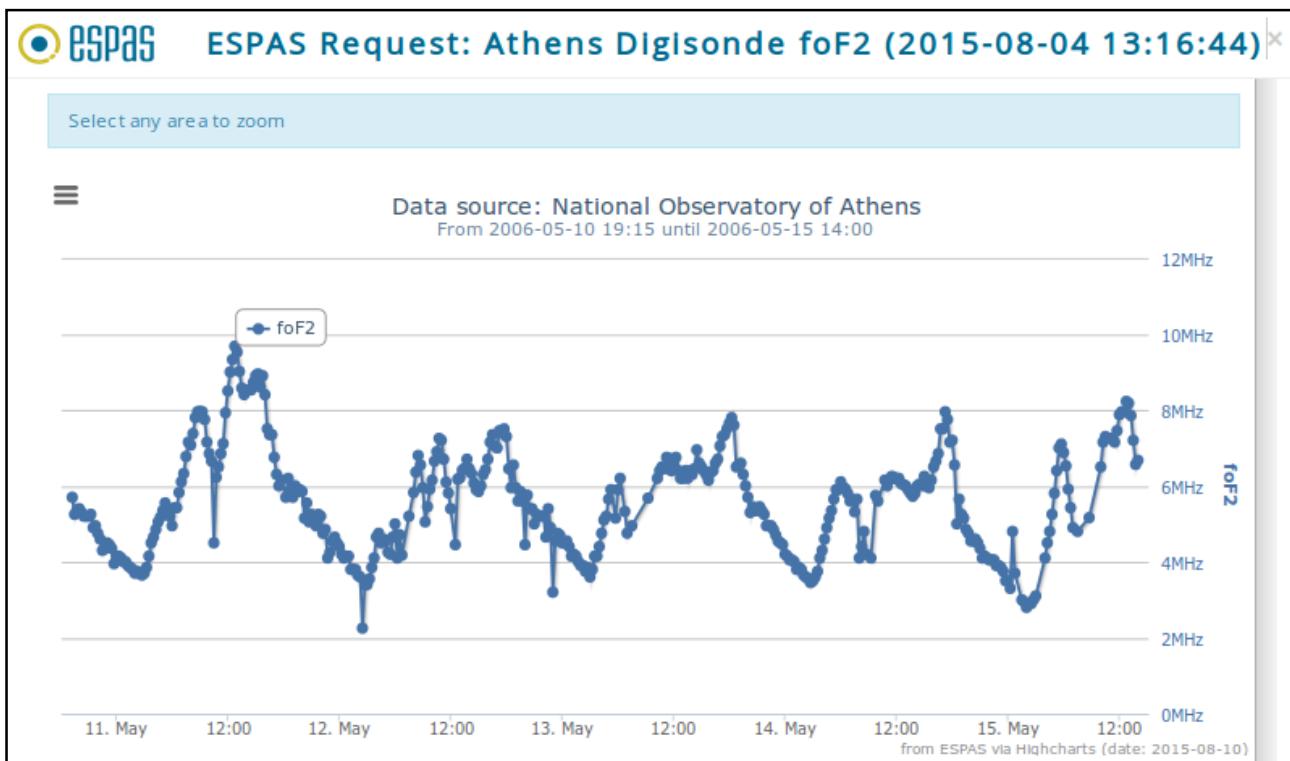
```
<swe:DataArray xsi:schemaLocation="http://www.opengis.net/swe/2.0 http://schemas.opengis.net/sweCommon/2.0/swe.xsd">
- <swe:elementCount>
- <swe:Count>
<swe:value>424</swe:value>
</swe:Count>
</swe:elementCount>
- <swe:elementType name="tupleDefinition">
- <swe>DataRecord>
- <swe:field name="phenomenonTime">
- <swe:Time definition="http://www.opengis.net/def/property/OGC/0/PhenomenonTime">
<swe: uom code="ms"/>
<swe:label>Epoch</swe:label>
<swe:description>UTC Time</swe:description>
</swe:Time>
</swe:field>
- <swe:field name="foF2">
- <swe:Quantity definition="http://ontology.espas-fp7.eu/observedProperty/CriticalFrequency_F2-Layer">
<swe: uom code="MHz"/>
<swe:label>foF2</swe:label>
<swe:description>F2-layer Critical Frequency</swe:description>
</swe:Quantity>
</swe:field>
</swe>DataRecord>
</swe:elementType>
- <swe:encoding>
<swe:TextEncoding blockSeparator="@@" tokenSeparator="/" />
</swe:encoding>
- <swe:values>
424@@2006-05-10T19:15:00Z .5.7@@2006-05-10T19:30:00Z .5.25@@2006-05-10T19:45:00Z .5.35@@2006-05-10T20:00:00Z .5.4@@2006-05-10T20:15:00Z .5.3@@2006-05-10T20:30:00Z .5.2@@2006-05-10T20:45:00Z .5.2@@2006-05-10T21:00:00Z .5.2@@2006-05-10T21:15:00Z .5.25@@2006-05-10T21:30:00Z .4.9@@2006-05-10T21:45:00Z .4.95@@2006-05-10T22:00:00Z .4.75@@2006-05-10T22:15:00Z .4.6@@2006-05-10T22:30:00Z .4.3@@2006-05-10T22:45:00Z .4.35@@2006-05-10T23:00:00Z .4.5@@2006-05-10T23:15:00Z .4.45@@2006-05-10T23:30:00Z .4.35@@2006-05-10T23:45:00Z .3.95@@2006-05-11T00:00:00Z .4.15@@2006-05-11T00:15:00Z .4.15@@2006-05-11T00:30:00Z .4.1@@2006-05-11T00:45:00Z .4.0@@2006-05-11T01:00:00Z .4.0@@2006-05-11T01:15:00Z .3.9@@2006-05-11T01:30:00Z .3.85@@2006-05-11T01:45:00Z .3.8@@2006-05-11T02:00:00Z .3.7@@2006-05-11T02:15:00Z .3.75@@2006-05-11T02:30:00Z .3.7@@2006-05-11T02:45:00Z .3.65@@2006-05-11T03:00:00Z .3.7@@2006-05-11T03:15:00Z .3.85@@2006-05-11T03:30:00Z .4.15@@2006-05-11T03:45:00Z .4.5@@2006-05-11T04:00:00Z .4.65@@2006-05-11T04:15:00Z .4.85@@2006-05-11T04:30:00Z .5.05@@2006-05-11T04:45:00Z .5.175@@2006-05-11T05:00:00Z .5.35@@2006-05-11T05:15:00Z .5.55@@2006-05-11T05:30:00Z .5.4@@2006-05-11T05:45:00Z .5.2@@2006-05-11T06:00:00Z .4.95@@2006-05-11T06:15:00Z .5.425@@2006-05-11T06:30:00Z .5.425@@2006-05-11T06:45:00Z .5.825@@2006-05-11T07:00:00Z
```

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10. In order to view a plot of the data values, click the **Linear plot** option of the **Get Plot Data as** drop down menu.

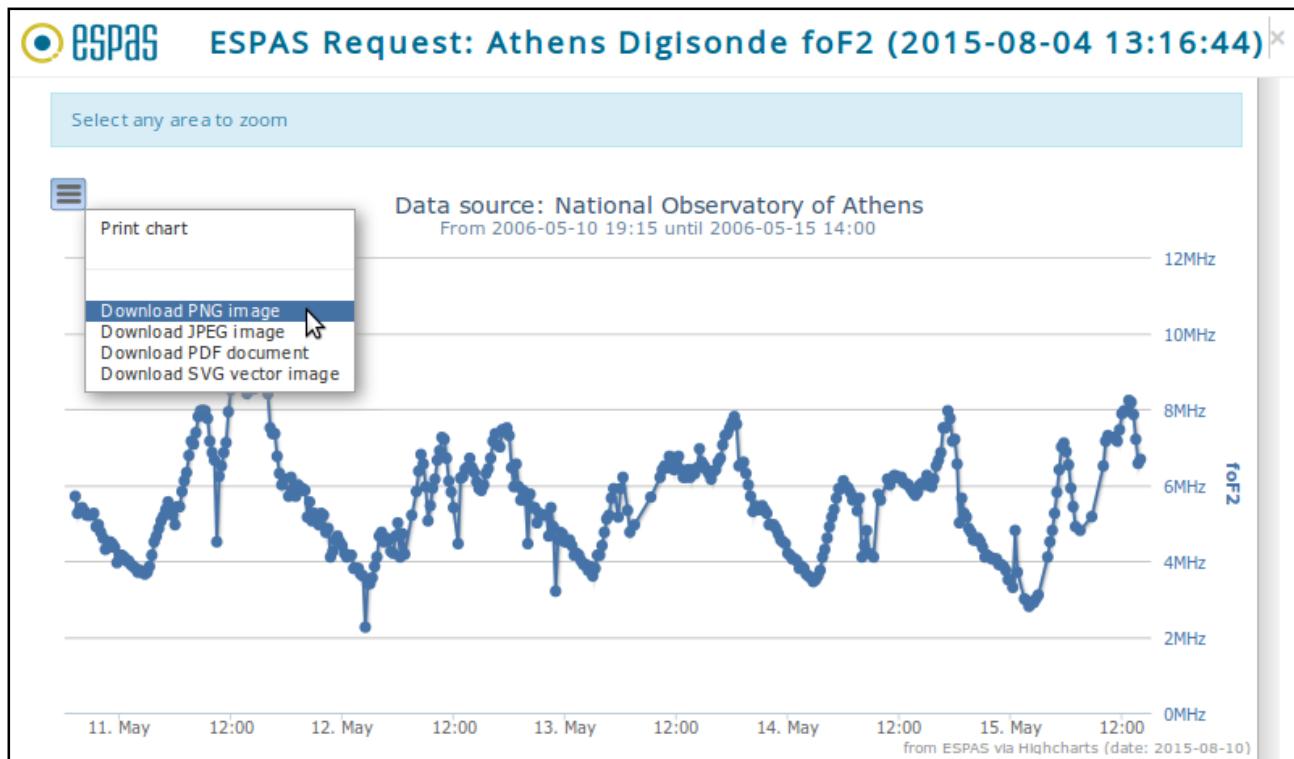
A screenshot of the ESPAS search interface. At the top, it shows a link to 'Athens Digisonde foF2 (2015-08-04 13:16:44)' and a status of 'COMPLETED'. Below this, there are several buttons: 'Get Data as' (dropdown), 'Get Plot Data as' (dropdown), and 'Linear plot' (highlighted with a cursor). To the right are buttons for 'Refresh Status', 'Resubmit Request', and 'View Search Results'. A large blue box labeled 'Query Options' contains the text 'Observation Collections Athens Digisonde SAO files (autoscaled)', 'Time Periods 2006-05-10 19:00:00 - 2006-05-15 14:14:00 00:00 - 23:59 UTC', and 'Selected Observed Properties F2-layer Critical Frequency'.

11. The plot of the downloaded data values open in a new pop up window. You can select any area to zoom.



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12. You can save the plot locally on your computer by clicking the button at the top left corner and then selecting the preferable format.



1.12.4 My Location Searches

The “My Location Searches” page presents the history and detailed information of your location search requests. Note that for each completed location search request you will have access to the results until the expiration date. Afterwards, the request is expired and you cannot view the results.

For each location search request you can:

- view its status: A request is characterized by its status, which can have one of the following values:
 - Submitting: the request is being submitted to the ESPAS system. You should wait until the status becomes “Completed” to view the results.
 - Running: the request is running. You should wait until the status becomes “Completed” to view the results.
 - Completed: the request has been completed successfully. You can view the results of the location search request until the expiration date. Afterwards, the request is expired and you cannot view the results.
 - Pending: the request is in a pending state and an appropriate message is displayed. You should wait until the status becomes “Completed”.
 - Expired: the request has expired. The results of the location search are not available any more.
 - Failed: the request has failed and the reason of failure is reported.
 - Undefined: The request is in undefined status. You should contact the ESPAS administrator (Home Page → Contact Us).
- refresh the status: You can refresh the status of a request that is in submitting, pending or running status.
- name the location search: You can provide a name to the location search, if there is no available.
- rename the location search: You can rename the location search.
- View the location search results: You can view the location search results of the request (opens in a new window).

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1. In order to view the history of your location searches requests, click **My Account → My Location Searches** from the main menu.

The screenshot shows the ESPAS homepage. At the top right, there are links for "Hello, Anna Charisi", "Sign Out", "ESPAS Project", and "Contact Us". Below these, the text "near earth space data infrastructure for e-science" is displayed. A horizontal navigation bar at the top includes "HOME", "SEARCH", "BROWSE", "ESPAS POLICIES", "VALUE ADDED SERVICES", "SUPPORT", and "MY ACCOUNT". The "MY ACCOUNT" button is highlighted with a blue background. On the left, a sidebar lists services: 1. Metadata search by (Time, Assets, Observed Properties, Observation Collections, Location), 2. Download of Data Files, 3. Download of extracted parameters (Plots). In the center, there are two boxes: "Search and Download" (observations, collections, files or data from a large number of data providers) and "News / Announcements" (ESPAS Training School information). At the bottom, a text box states: "ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts. Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors."

2. A list of all your location search requests is presented in chronological order (oldest first). The name of the request is the name you define using the **Name your location search** button presented inside each request (see next step). Inside the parenthesis the local time of the submission is presented. You can sort the requests by submission date, name or status by clicking on the appropriate option of the **Sort by** drop down menu (1) in ascending or descending order (2). Moreover, you can use the search box “filter” (3) to search for requests with a specific name, date or status.

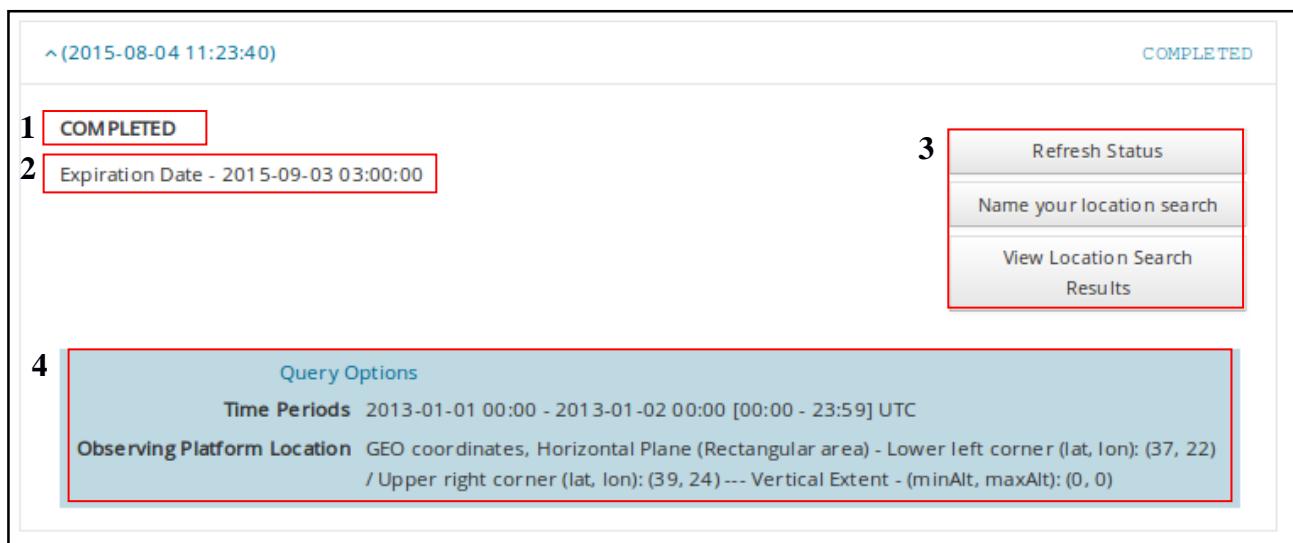
The screenshot shows the "My Location Searches" page. At the top right, there are links for "Hello, Anna Charisi", "Sign Out", "ESPAS Project", and "Contact Us". Below these, the text "near earth space data infrastructure for e-science" is displayed. A horizontal navigation bar at the top includes "HOME", "SEARCH", "BROWSE", "ESPAS POLICIES", "VALUE ADDED SERVICES", "SUPPORT", and "MY ACCOUNT". The "MY ACCOUNT" button is highlighted with a blue background. On the left, a section titled "My Location Searches" contains instructions: "Check out your location searches. They have a time stamp of the request. Just click on a location search to see its progress, information about it, and a link to the results once it is completed." Below this, there is a search bar labeled "Filter..." (3) and two dropdown menus labeled "Sort by Date" (1) and "Order by Descending" (2). A list of three search entries is shown: "Location Search 1 (2015-08-10 00:21:10)" (COMPLETED), "(2015-08-09 23:45:26)" (COMPLETED), and "(2015-08-04 11:23:40)" (COMPLETED). To the right, a sidebar titled "IN THIS SECTION" lists: "My Personal Info", "My Dataset File Downloads", "My Data Values Downloads", and "My Location Searches" (which is highlighted with a blue background).

3. If you want to check the status of a location search request or view more information about it, click on the name of the specific request. In the following example the information about the location search request that was submitted on 2015-08-04 11:23:40 (local time) is presented.

The status of the request is shown (1) (which is “completed” in this example) along with the expiration date (2) (See also the section 1.12.4 for a description of the possible status values). Note that you can view the location search results until the expiration date (2). Afterwards, the request is expired and you don't have access to the location search results.

On the right (3) there are the buttons to name the location search (if there is no available) and view the location search results.

At the bottom (4) the query options of the request are presented. In this example, the query options of the request are “*Time Periods = 2013-01-01 00:00 - 2013-01-02 00:00 [00:00 - 23:59] UTC AND Observing Platform Location = GEO coordinates, Horizontal Plane (Rectangular area) - Lower left corner (lat, lon): (37, 22) / Upper right corner (lat, lon): (39, 24) --- Vertical Extent - (minAlt, maxAlt): (0, 0)*”.



4. Click on the **View Location Search Results** button to view the results from the location search query. The “Location Results” page is presented that lists the observation collections that contain the observations satisfying the query criteria. Please refer to section “1.13 Results/Location Results page” for a detailed description of all the options offered in the “Location Results” page.

1.13 News

- If you want to view News regarding ESPAS project, click on the **NEWS** link in the bottom menu bar of the Home page.

The screenshot shows the ESPAS project website homepage. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo and the tagline "near earth space data infrastructure for e-science" are displayed. The main content area includes sections for "Search and Download" and "Register". A "News / Announcements" box contains a single item about the ESPAS Training School. Below this, a text box states that ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment. At the bottom, there are icons for NEWS (highlighted with a red box), EVENTS, PARTNERS, and DATA PROVIDERS. A European Union flag is at the very bottom.

- The News page of the ESPAS project website will open in a new tab/window.

The screenshot shows the "News & Events" section of the ESPAS project website. The top navigation bar includes links for HOME, OVERVIEW, COMMUNITY, NEWS & EVENTS (which is the active tab), and PUBLICATIONS. A search bar is also present. The main content area displays a list of news items under the heading "News". The news items listed are:

- ESPAS Training School - second announcement
- ESPAS Project Granted Extension
- ESPAS in "Big Data from Space conference"
- ESPAS Training School - first announcement
- ESPAS CDAW during ESWW11
- EISCAT_3D User Meeting in Uppsala, Sweden
- ICRI 2014
- ESPAS Release 2 in ESWW10
- ESPAS presentations in the ESWW10, Antwerp, 18-22 November 2013
- Tenth European Space Weather Week (ESWW10)

Pagination controls (1, 2, » End) are located at the bottom of the news list. On the right side, there is a sidebar titled "In this section" with links for News, Events, and Meetings. The European Union flag is at the bottom.

1.14 Events

- If you want to view News regarding ESPAS project, click on the **EVENTS** link in the bottom menu bar of the Home page.

ESPAS provides the following services:

1. Metadata search by
 - o Time
 - o Assets (Instruments and Models)
 - o Observed Properties
 - o Observation Collections
 - o Location
2. Download of Data Files
3. Download of extracted parameters
 - o Plots of extracted parameters

Search and Download
observations, collections, files or data from a large number of data providers

Register
your data in ESPAS

News / Announcements

- The ESPAS Training School will be held in Warsaw from 19th to 23rd October 2015. See <http://www.espas-fp7.eu/school> for further details.

ESPAS is a data infrastructure facilitating access to observations, models and predictions of the near-Earth space environment extending from the Earth's atmosphere up to the outer radiation belts.

Access to a large number of repositories with heterogeneous data from ground and space, in situ and remote sensors.

NEWS **EVENTS** **PARTNERS** **DATA PROVIDERS**

The ESPAS Consortium - Copyright 2012
This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 283676.

- The Events page of the ESPAS project website will open in a new tab/window.

Events Calendar

See by year See by month See by week See Today See by categories Search

All categories

10 November 2011	Thursday 10 November 2011 - Friday 11 November 2011 ESPAS Kick off meeting by member+
30 January 2012	Monday 30 January 2012 - Tuesday 31 January 2012 ESPAS 1st Technical Meeting by This email address is being protected from spambots. You need JavaScript enabled to view it.
08 May 2012	Tuesday 08 May 2012 ESPAS 2nd Technical Meeting by This email address is being protected from spambots. You need JavaScript enabled to view it.
09 May 2012	Wednesday 09 May 2012 - Friday 11 May 2012 ESPAS Plenary meeting by Technical Manager
04 June 2012	Monday 04 June 2012 - Saturday 09 June 2012 EU School on Space Weather fundamental plasma processes by This email address is being protected from spambots. You need JavaScript enabled to view it.
18 July 2012	Wednesday 18 July 2012 Teleconference with the Steering Committee by This email address is being protected from spambots. You need JavaScript enabled to view it.

In this section

News

Events

Meetings

1.15 Partners

- If you want to view the Partners of ESPAS project, click on the **PARTNERS** link in the bottom menu bar of the Home page.

- The Partners page of the ESPAS project website will open in a new tab/window.

1.16 Data Providers

- If you want to view the Data Providers of ESPAS project, click on the **DATA PROVIDERS** link in the bottom menu bar of the Home page.

The screenshot shows the ESPAS project website homepage. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo is displayed along with the tagline "near earth space data infrastructure for e-science". The main content area has several sections: "ESPAS provides the following services:" (listing 1. Metadata search by Time, Assets, Observed Properties, Observation Collections, Location; 2. Download of Data Files; 3. Download of extracted parameters), "Search and Download" (observations, collections, files or data from a large number of data providers), "Register" (your data in ESPAS), and "News / Announcements" (mentioning the ESPAS Training School). Below these sections, there is a statement about ESPAS being a data infrastructure for near-Earth space environment observations, models, and predictions. A note also mentions access to a large number of repositories. At the bottom, there are icons for NEWS, EVENTS, PARTNERS, and DATA PROVIDERS, with the DATA PROVIDERS icon highlighted by a red box. The European Union flag is also present at the bottom left.

- The Data Providers page of the ESPAS project website will open in a new tab/window.

The screenshot shows the "Data Providers" page under the "Community" section of the ESPAS project website. The page title is "Data Providers". It states that ESPAS will provide access to various databases and data collections. A table lists these sources and their corresponding types of data:

Source	Types of data
Near-Earth space data from ground-based sensors and instruments	
DIAS system	Ionosonde parameters, ionograms, European maps of critical frequencies — 8 Digisondes
ESWUA database	Usable frequencies for HF communications and ionograms
European ionosondes Tromsø, Gibrilman, Sodankylä, Warsaw, Hornsund	Vertical sounding parameters and ionograms
EISCAT incoherent scatter radars	Electron density profiles and temperatures from EISCAT
EISCAT dynasondes	Ionosonde parameters, ionograms
Malvern ISR database	Electron density profiles
GIRO databases	Ionograms, skymaps and drift files from 50 Digisondes around the world
SWACI database	TEC GNSS parameters and European maps
SuperDARN	Convection maps
INGV magnetometers	Magnetic field data from three permanent geomagnetic observatories in Italy
SGO magnetometer	Magnetic field data from Sodankylä Geophysical Observatory
DTU Space Magnetometer Network	Magnetic field data from Greenland, Denmark and the South Atlantic

On the right side, there is a sidebar titled "In this section" with links to Partners, Data Providers, Stakeholders, and Related Links. At the top of the page, there is a navigation bar with links for HOME, OVERVIEW, COMMUNITY, NEWS & EVENTS, PUBLICATIONS, and a search bar.

2. Metadata Search: Examples

ESPAS portal provides metadata searches for observations based on the following search criteria: time period, assets (the instruments and models), observed properties, observation collections and platform location. Please refer also to section “1.7 Search Menu” for detailed information.

The metadata search is open to all users with no registration required.

In order to perform a query for observations, ESPAS portal supports two types of searches: the progressive search and the spatial/temporal search.

2.1 Progressive Search

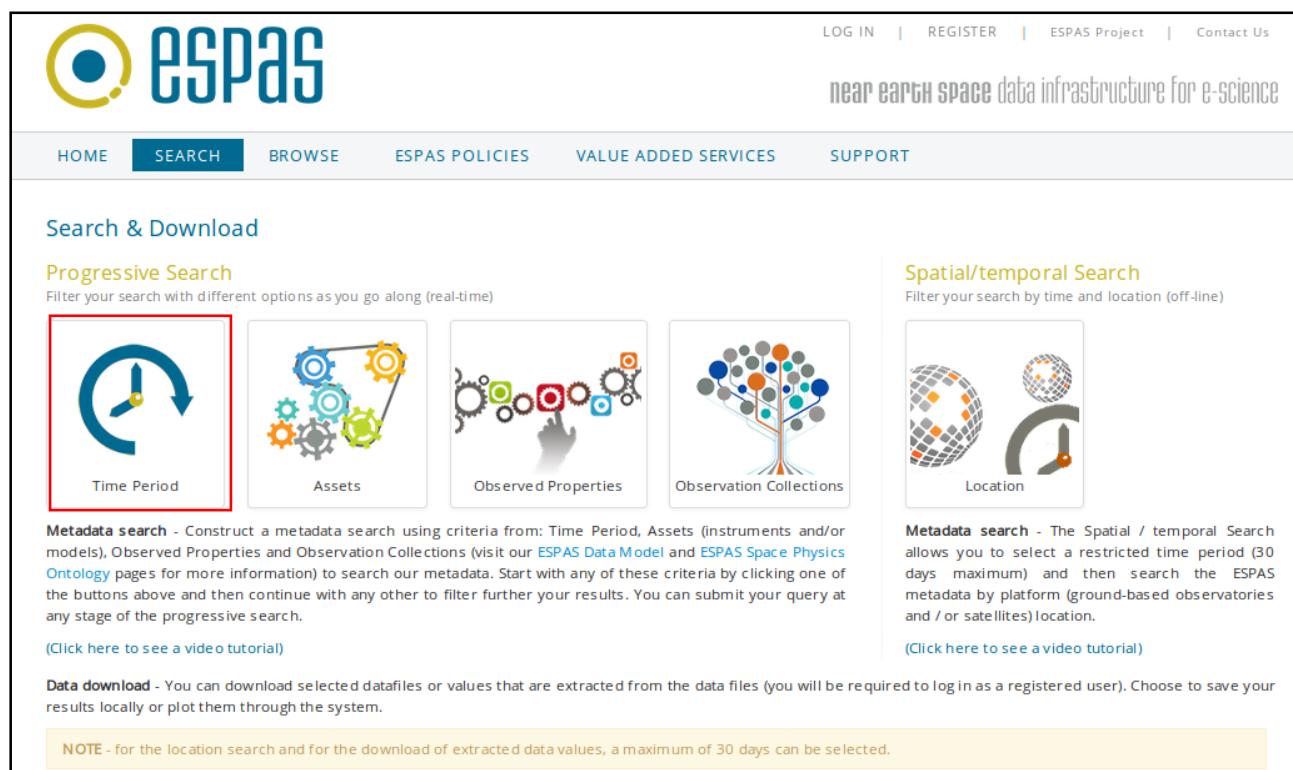
The progressive search helps you to construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections. You can start your query with any of these criteria by clicking one of the buttons in the “Search & Download” page and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search. Please refer also to section “1.7.1 Progressive Search” for detailed information.

An example of a progressive search is presented in the following steps. For this metadata search, registration and log in the ESPAS portal is not required.

The underlying purpose is the investigation of the ionospheric variation over Athens in terms of observed critical frequencies during the geomagnetic storm event occurred between 5th and 9th August 2011. The suggested workflow for the search criteria for this progressive search is: Time period → Observed property → Assets → Observation Collections → Submit. Note that all the other permutations of the search criteria (using the same options for each criterion), will lead to the same results.

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1. In order to start a metadata search (progressive search) using as the first criterion the time period, click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Time Period** button.



The screenshot shows the ESPAS homepage with the title "near earth space data infrastructure for e-science". The navigation bar includes links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the logo, there are links for HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT.

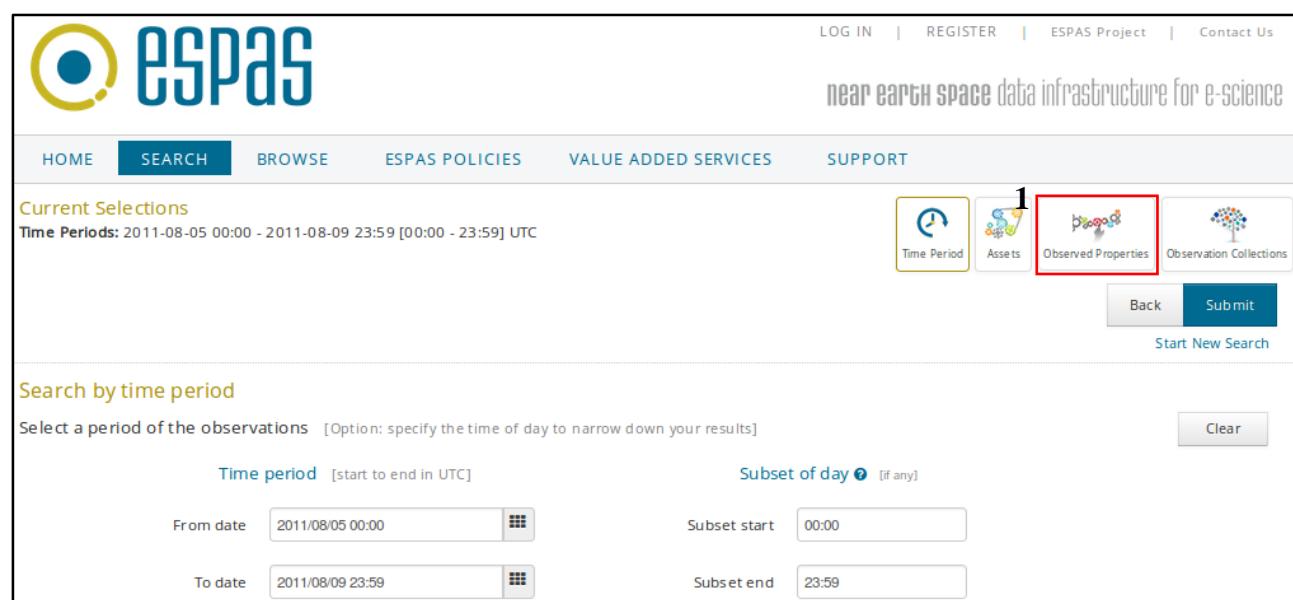
The "Search & Download" section features two main sections: "Progressive Search" and "Spatial/temporal Search".

Progressive Search: This section is described as "Filter your search with different options as you go along (real-time)". It includes four icons: "Time Period" (a clock with a circular arrow), "Assets" (interlocking gears), "Observed Properties" (a hand pointing at a gear), and "Observation Collections" (a tree with colored dots). A note below states: "Metadata search - Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search." A link "(Click here to see a video tutorial)" is provided.

Spatial/temporal Search: This section is described as "Filter your search by time and location (off-line)". It includes two icons: "Location" (a person icon with a globe) and "Observation Collections" (a tree with colored dots). A note below states: "Metadata search - The Spatial / temporal Search allows you to select a restricted time period (30 days maximum) and then search the ESPAS metadata by platform (ground-based observatories and / or satellites) location." A link "(Click here to see a video tutorial)" is provided.

NOTE: for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

2. In the "Search by time period" page, choose the time period from **5th August 2011 00:00** to **9th August 2011 23:59** using the buttons on the right of the **From date** and **To date** fields (see also section 1.7.1.1 Time period). Leave the default values for the "Subset of day". Note the **Current Selections** area that presents the current selection of the time period. Then, click on the **Observed Properties** button (1) to continue your query.



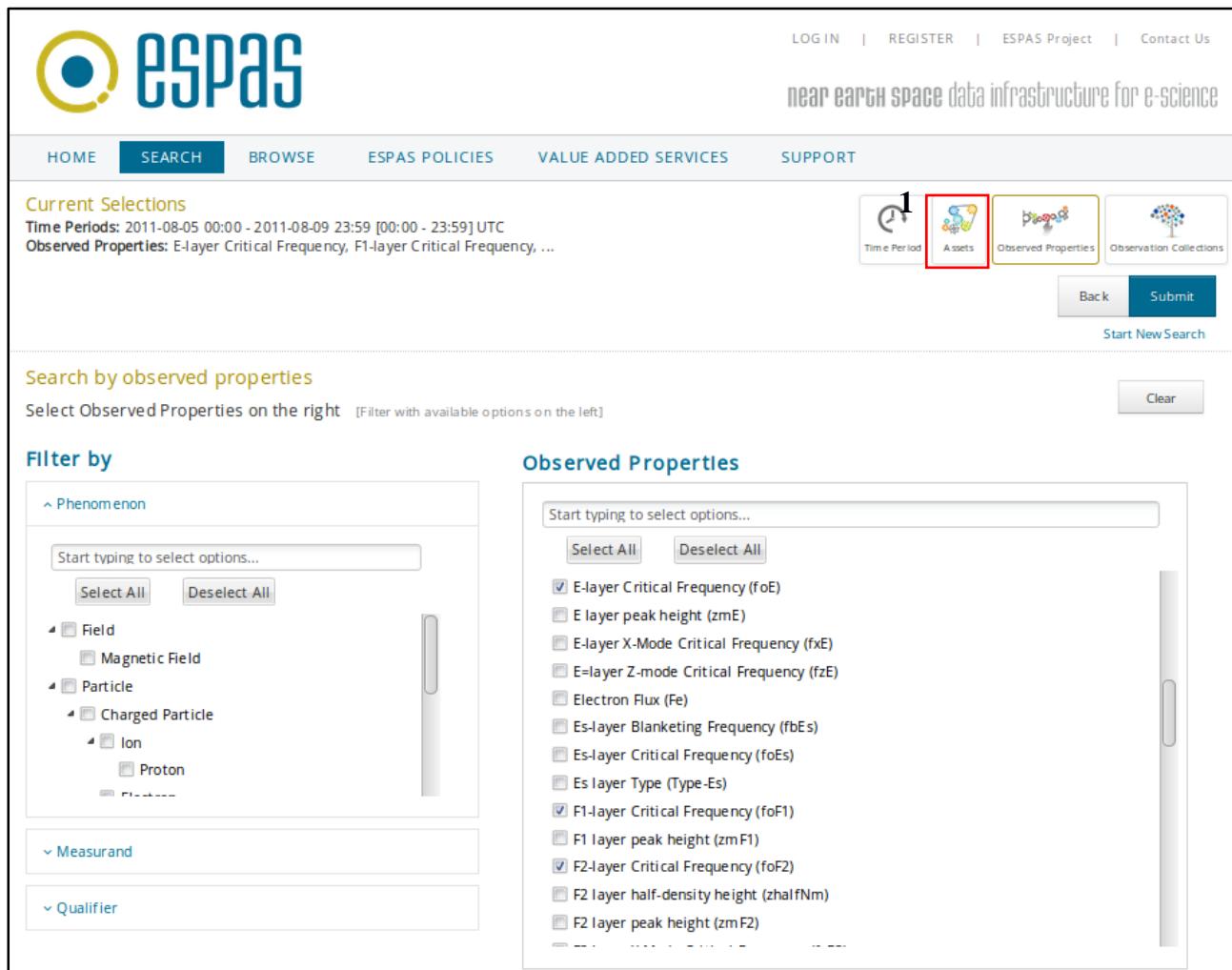
The screenshot shows the "Search by time period" page of the ESPAS interface. The top navigation bar and logo are identical to the home page.

The "Current Selections" area displays the selected time period: "Time Periods: 2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC".

The "Search by time period" section contains fields for "Time period" (From date: 2011/08/05 00:00, To date: 2011/08/09 23:59), "Subset of day" (Subset start: 00:00, Subset end: 23:59), and "Subset of day" (Subset start: 00:00, Subset end: 23:59).

On the right side, there are four buttons: "Time Period", "Assets", "Observed Properties" (which is highlighted with a red box), and "Observation Collections". Below these buttons are "Back", "Submit", and "Start New Search" buttons.

3. In the “Search by observed properties” page, choose the following observed properties: *F1-layer critical frequency, F2-layer critical frequency and E-layer critical frequency* by clicking the appropriate check boxes (see also section 1.7.1.3 Observed properties). Note the **Current Selections** area that presents the current selection of the time period and observed properties. Then, click on the **Assets** button (1) to continue your query.



The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main menu includes HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. On the left, a sidebar titled "Current Selections" shows a time period from 2011-08-05 00:00 to 2011-08-09 23:59 UTC and observed properties like E-layer Critical Frequency, F1-layer Critical Frequency, etc. On the right, there are four buttons: Time Period, Assets (highlighted with a red box), Observed Properties, and Observation Collections. Below these buttons are Back, Submit, Start New Search, Clear, and a "Filter with available options on the left" link. The central area has two main sections: "Filter by" on the left and "Observed Properties" on the right. The "Filter by" section contains dropdown menus for Phenomenon, Field, Particle, Measurand, and Qualifier. The "Observed Properties" section contains a list of checkboxes for various properties, with several checked, including E-layer Critical Frequency (foE), F1-layer Critical Frequency (foF1), and F2-layer Critical Frequency (foF2).

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4. In the “Search by assets” page, choose the following asset: *Athens Digisonde* by clicking the appropriate check box (see also section 1.7.1.2 Assets). Note the **Current Selections** area that presents the current selection of the time period, observed properties and assets. Then, click on the **Observation Collections** button (1) to continue your query.

The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links for LOGIN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has tabs for HOME, SEARCH (which is selected), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. On the left, a "Current Selections" panel shows Time Periods (2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC), Observed Properties (E-layer Critical Frequency, F1-layer Critical Frequency, ...), and Assets (Athens Digisonde). On the right, there are four buttons: Time Period, Assets (highlighted with a red box), Observed Properties, and Observation Collections (also highlighted with a red box). Below these buttons are Back, Submit, and Start New Search links. A "Clear" link is also present. The central part of the page is titled "Search by assets" and contains sections for "Filter by" and "Assets". The "Filter by" section includes dropdown menus for Asset Type, Platform, and Project, each with "Select All" and "Deselect All" buttons. The "Assets" section features a search input field, "Select All" and "Deselect All" buttons, and two expandable categories: "Instruments" (with Athens Digisonde checked) and "Models" (with ARTIST, CCIR F peak model, DSND, Interpre, IRI (International Reference Ionosphere), SIRM, and SIRMUP listed).

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5. In the “Search by observation collections” page, click on **Select All** button to select all the Observation Collections (see also section 1.7.1.4 Observation Collections). Note the **Current Selections** area that presents the current selection of the time period, observed properties, assets and observation collections. Then, click on the **Submit** button to finish your query.

Current Selections

Time Periods: 2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC

Observed Properties: E-layer Critical Frequency, F1-layer Critical Frequency, ...

Assets: Athens Digisonde

Observation Collections: Athens Digisonde SAO files (autoscaled), DIAS daily f-plots of fmin,foF2 from Athens Digisonde

Time Period Assets Observed Properties Observation Collections

Back Submit Start New Search

Search by observation collections

Select Observation Collections on the right [Filter with available options on the left]

Observation Collections that are not related to an observation, are not displayed in this form. For a complete list of all the Observation Collections registered in ESPAS you can visit the Browse -> Metadata section

Clear

Filter by

Region of Space

Start typing to select options...

Select All Deselect All

Ionosphere

Dimensionality

Observation Collection

Start typing to select options...

Select All Deselect All

Athens Digisonde SAO files (autoscaled)

DIAS daily f-plots of fmin,foF2 from Athens Digisonde

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6. The “Results” page is presented that lists the two Observation Collections that contain the observations that satisfy the query criteria. Using the filters on the left, you can refine the results presented on the right (see also section 1.7.3 Results/Location Results pages).

The screenshot shows the ESPAS search interface. At the top, there is a navigation bar with links for LOG IN, REGISTER, ESPAS Project, and Contact Us. Below the navigation is the ESPAS logo and the text "near earth space data infrastructure for e-science". The main menu includes HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT.

Current Selections:

- Time Periods: 2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC
- Observed Properties: E-layer Critical Frequency, F1-layer Critical Frequency, ...
- Assets: Athens Digisonde
- Observation Collections: Athens Digisonde SAO files (autoscaled), DIAS daily f-plots of fmin,foF2 from Athens Digisonde

On the right side, there are four buttons: Time Period (with a clock icon), Assets (with a gear icon), Observed Properties (with a bar chart icon), and Observation Collections (with a tree icon). Below these buttons are Back, Submit, and Start New Search links.

Results: Select Download dataset files or data values (observed properties) and go to My Account to monitor their progress.

Refine by:

- Project
- Observation Collection
- Instrument
- Region of Space
- Platform
- Model
- Dimensionality Timeline
- Dimensionality Instance

Number of Observations : 4 [Download](#) [Data Providers' status](#) [Share your results](#)

Observation Collections (2)

- Athens Digisonde SAO files (autoscaled)
- DIAS daily f-plots of fmin,foF2 from Athens Digisonde

2.2 Spatial/temporal Search

The spatial/temporal search performs a metadata search using as criteria the time period (30 days maximum) and the location of the platform (ground-based observatories and/or satellites) on which the instruments are mounted and used for the generation of the observations. Please refer to chapter “1.7.2 Spatial/temporal Search” for detailed information.

An example of a spatial/temporal search is presented in the following steps. For this metadata search, registration and log in the ESPAS portal is not required, however it is highly recommended to register and login to ESPAS portal in order to be notified via e-mail when the location requests are completed and to monitor them through **My Account → My Location Searches** menu.

The purpose of this example is to find the observations obtained from all available instruments in the middle to low latitudes over Europe during the geomagnetic storm event occurred between 5th and 9th August 2011. Regarding the location, the requested area may be expressed by a rectangular area in 3D space defined by (in GEO spherical coordinates):

- lower left corner the point with coordinates Latitude = 30 degrees, Longitude = -10 degrees,
- upper right corner the point with coordinates Latitude = 45 degrees, Longitude = 40 degrees,
- vertical extend from 0 to 500 km above the Earth surface

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1. In order to start a metadata search (spatial/temporal search), click **Search** from the main menu or click **Search and Download** at the home page, and then click the **Location** button.

The screenshot shows the ESPAS homepage with the following layout:

- Header:** LOG IN | REGISTER | ESPAS Project | Contact Us
near earth space data infrastructure for e-science
- Main Navigation:** HOME | SEARCH (highlighted in blue) | BROWSE | ESPAS POLICIES | VALUE ADDED SERVICES | SUPPORT
- Section: Search & Download**
- Progressive Search:** Filter your search with different options as you go along (real-time). Includes icons for Time Period, Assets, Observed Properties, and Observation Collections.
- Spatial/temporal Search:** Filter your search by time and location (off-line). Includes icons for Location (highlighted with a red box) and a globe.
- Metadata search descriptions:**
 - Time Period:** Construct a metadata search using criteria from: Time Period, Assets (instruments and/or models), Observed Properties and Observation Collections (visit our [ESPAS Data Model](#) and [ESPAS Space Physics Ontology](#) pages for more information) to search our metadata. Start with any of these criteria by clicking one of the buttons above and then continue with any other to filter further your results. You can submit your query at any stage of the progressive search.
 - Location:** The Spatial / temporal Search allows you to select a restricted time period (30 days maximum) and then search the ESPAS metadata by platform (ground-based observatories and / or satellites) location.
- Tutorials:** (Click here to see a video tutorial) for both search types.
- Data download:** You can download selected datafiles or values that are extracted from the data files (you will be required to log in as a registered user). Choose to save your results locally or plot them through the system.
- Note:** NOTE - for the location search and for the download of extracted data values, a maximum of 30 days can be selected.

2. In the time period selection form, specify a time period: from 5th to 9th August 2011, using the **From date** and **To date** fields. Leave the default values for the **Subset start** and **Subset end** fields.

Search by time and location

Select a period of the observations [Option: specify the time of day to narrow down your results] Clear

Time period [start to end in UTC]

From date	2011/08/05 00:00	<input type="button" value=""/>	Subset start	00:00	<input type="button" value=""/>
To date	2011/08/09 23:59	<input type="button" value=""/>	Subset end	23:59	<input type="button" value=""/>

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3. Regarding the platform location, use the “Coordinates in GEO” tab and the “Spherical” option to specify a rectangular area with lower left corner the point with coordinates Latitude = 30 degrees, Longitude = -10 degrees, upper right corner the point with coordinates Latitude = 45 degrees, Longitude = 40 degrees and vertical extend from 0 to 500 Km above the Earth surface.

Select the location of the platforms (ground-based observatories and / or satellites)

Coordinates in GEO Coordinates in GSE

Select coordinates Cartesian
 Spherical

1. Horizontal Plane

RectangularArea Circular Area

Lower left corner refers to the smaller and upper right corner refers to the larger values in a mathematical sense (e.g., 30 deg < 60 deg but -60 deg < -30 deg)

Enter the coordinates of the lower left corner

Latitude (deg) Longitude (deg)
30 -10

Enter the coordinates of the upper right corner

Latitude (deg) Longitude (deg)
45 40

Enter the coordinates of the circular area's center

Latitude (deg) Longitude (deg)
000.00 000.00

2. Vertical Extent

mean Earth radius = 6371 km

Minimum distance beyond mean Earth radius (km):
0

Maximum distance beyond mean Earth radius (km):
500

4. The **Current Selections** area presents the current selection of the time period and observing platform location. Click on the **Submit** button to finish your query.

Hello, Anna Charisi | Sign Out | ESPAS Project | Contact Us

near earth space data infrastructure for e-science

HOME SEARCH BROWSE ESPAS POLICIES VALUE ADDED SERVICES SUPPORT MY ACCOUNT

Current Selections

Time Period: 2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC

Observing Platform Location: GEO coordinates, Horizontal Plane (Rectangular area) - Lower left corner (lat, lon): (30, -10) / Upper right corner (lat, lon): (45, 40) --- Vertical Extent - (minAlt, maxAlt): (0, 500)

Back Submit Start New Search

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5. The location request has been submitted in the ESPAS portal and it is in a “running” status. If you are not logged in the ESPAS portal, you should wait until the “Location Results” page is presented. If you visit another page, you cannot return in this “processing” page and you will lose the location request. However, if you are logged in, you can view the status of the location request by visiting the My Account → My Location Searches page, as it has been described in section “1.12.4 My Location Searches”.

The screenshot shows the ESPAS search results page. At the top, there is a navigation bar with links for HOME, SEARCH (which is highlighted in blue), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. To the right of the navigation bar are links for Hello, Anna Charisi, Sign Out, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. In the center, there is a section titled "Current Selections" which includes a "Time Period" (2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC) and an "Observing Platform Location" (GEO coordinates, Horizontal Plane (Rectangular area) - Lower left corner (lat, lon): (30, -10) / Upper right corner (lat, lon): (45, 40) --- Vertical Extent - (minAlt, maxAlt): (0, 500)). To the right of this section are buttons for Back, Submit, and Start New Search. Below this, there is a section titled "Location Results" with a message: "Select Download dataset files or data values (observed properties) and go to My Account to monitor their progress". A progress bar at the bottom indicates "Processing request..".

7. View the “Location Results” page. See also section 1.7.3 Results/Location Results pages.

3. Download of Data Files: Examples

The download of data files is a service that is available only from the “Results”/“Location Results” page after the submission of a progressive or spatial/temporal search request. This service requires registration and log in the ESPAS portal.

Below, an example of how to request and download data files from ESPAS portal is presented that is associated with the example presented in the section “2.1 Progressive Search”. The following steps apply to the “Results” page and are the same for both the progressive search “Results” and the spatial/temporal search “Location Results” page.

1. In the “Results” page click the **Dataset files** option from the **Download** drop down menu.

The screenshot shows the ESPAS search results page. At the top, there is a navigation bar with links for LOGIN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the text "near earth space data infrastructure for e-science" is displayed. The main content area has tabs for HOME, SEARCH (which is selected), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. Under the SEARCH tab, there is a section titled "Current Selections" with the following details:

- Time Periods: 2011-08-05 00:00 - 2011-08-09 23:59 [00:00 - 23:59] UTC
- Observed Properties: E-layer Critical Frequency, F1-layer Critical Frequency, ...
- Assets: Athens Digisonde
- Observation Collections: Athens Digisonde SAO files (autoscaled), DIAS daily f-plots of fmin,foF2 from Athens Digisonde

On the right side of this section are four icons: Time Period, Assets, Observed Properties, and Observation Collections. Below this section are buttons for Back, Submit, and Start New Search.

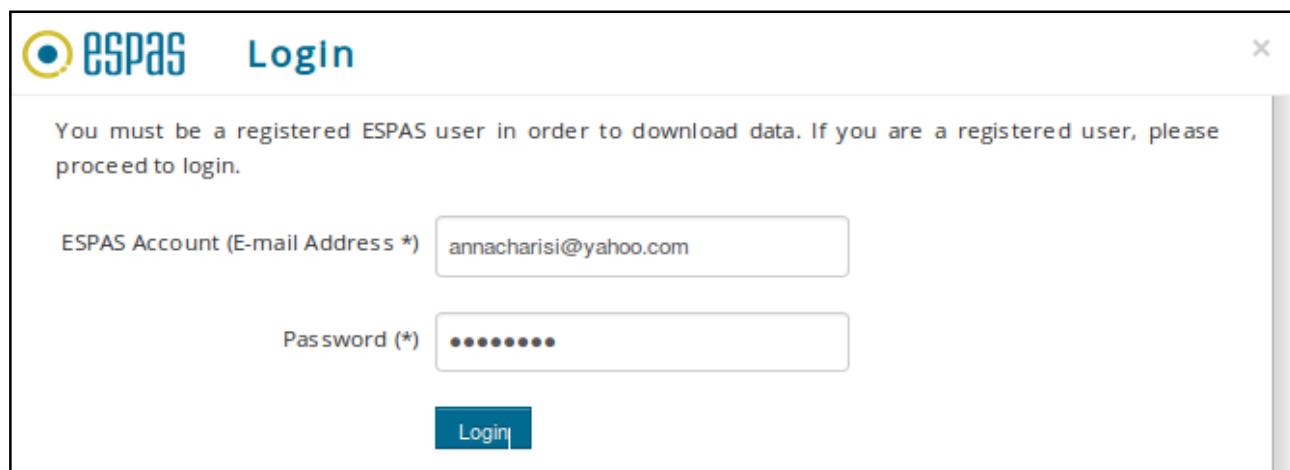
Under the "Results" heading, there is a message: "Select Download dataset files or data values (observed properties) and go to My Account to monitor their progress".

On the left, there is a "Refine by" sidebar with dropdown menus for various filters like Project, Observation Collection, Instrument, etc. On the right, there is a summary of observations: "Number of Observations : 4". Below this are two buttons: "Download" (with a dropdown menu) and "Data Providers' status". The "Download" dropdown menu is open, showing "Dataset files" (which is highlighted with a blue background) and "Data values".

The "Dataset files" option is highlighted with a blue background and a cursor arrow is pointing at it. Below the dropdown menu, there are two collapsed sections: "Athens Digisonde SAO files (autoscaled)" and "DIAS daily f-plots of fmin,foF2 from Athens Digisonde".

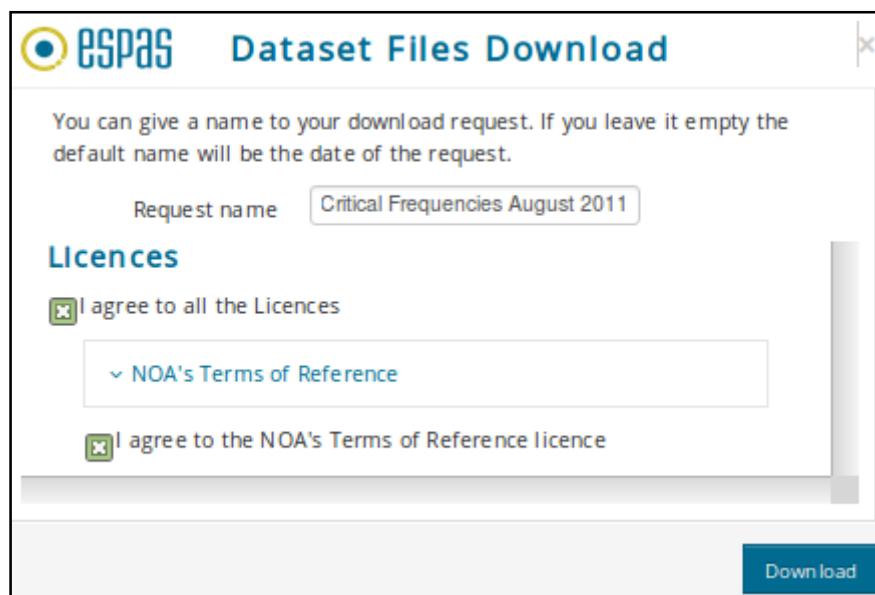
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2. You will be prompted to log in the ESPAS portal, if you are not already logged in.



The screenshot shows a login window for the ESPAS portal. At the top left is the ESPAS logo, followed by the word "Login". Below the logo is a message: "You must be a registered ESPAS user in order to download data. If you are a registered user, please proceed to login." There are two input fields: "ESPAS Account (E-mail Address *)" containing "annacharisi@yahoo.com" and "Password (*)" containing a series of dots. A blue "Login" button is at the bottom.

3. The “Dataset Files Download” page opens in a pop up window. You may give a name to your download request. If you leave it empty, the default name will be the submission date/time of the request. Additionally, a list of the licences of the ESPAS Data Providers that are related to the results is presented. Clicking on each licence, you can view the entire licence text. According to ESPAS Policies (see also section 1.9 ESPAS Policies), on requesting data, users are asked to agree to the data providers' licences. Therefore, you should tick the box “I agree to all the Licences” and click the **Download** button in order to submit your download request for all the results. However, if you wish to agree with some of the Data Providers' licenses, then only the data from these Data Providers will be available for download to you.



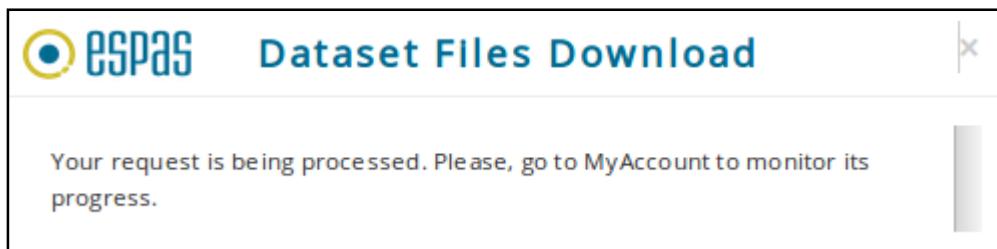
The screenshot shows a "Dataset Files Download" window. At the top left is the ESPAS logo, followed by the title "Dataset Files Download". Below the title is a message: "You can give a name to your download request. If you leave it empty the default name will be the date of the request." There is a "Request name" field containing "Critical Frequencies August 2011". A section titled "Licences" contains two checkboxes:

- I agree to all the Licences
- ▾ NOA's Terms of Reference
- I agree to the NOA's Terms of Reference licence

A blue "Download" button is at the bottom right.

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6. A message is displayed informing you that your request is being processed. You should visit the **My Account → My Dataset File Downloads** page to monitor its progress. You will be also informed by email upon the completion of the download request. Close this window by clicking the X in the top right corner.



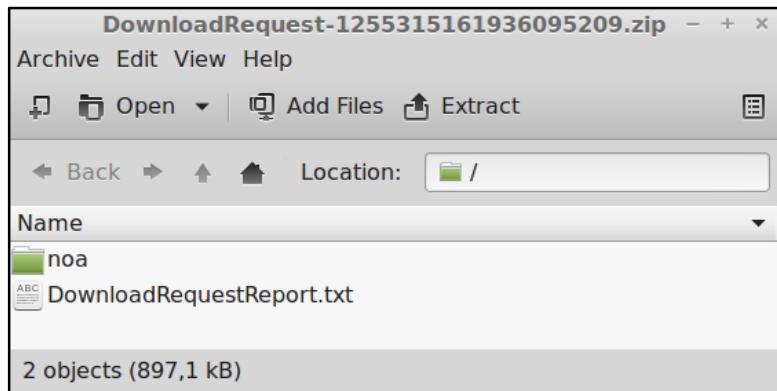
7. Visit the **My Account → My Dataset File Downloads** page to monitor the progress of the download request. If you want to check its status or view more information about it, click on its name: "Critical Frequencies August 2011" (see also section 1.12.2 My Dataset File Downloads).

Click on the link to download the data files.

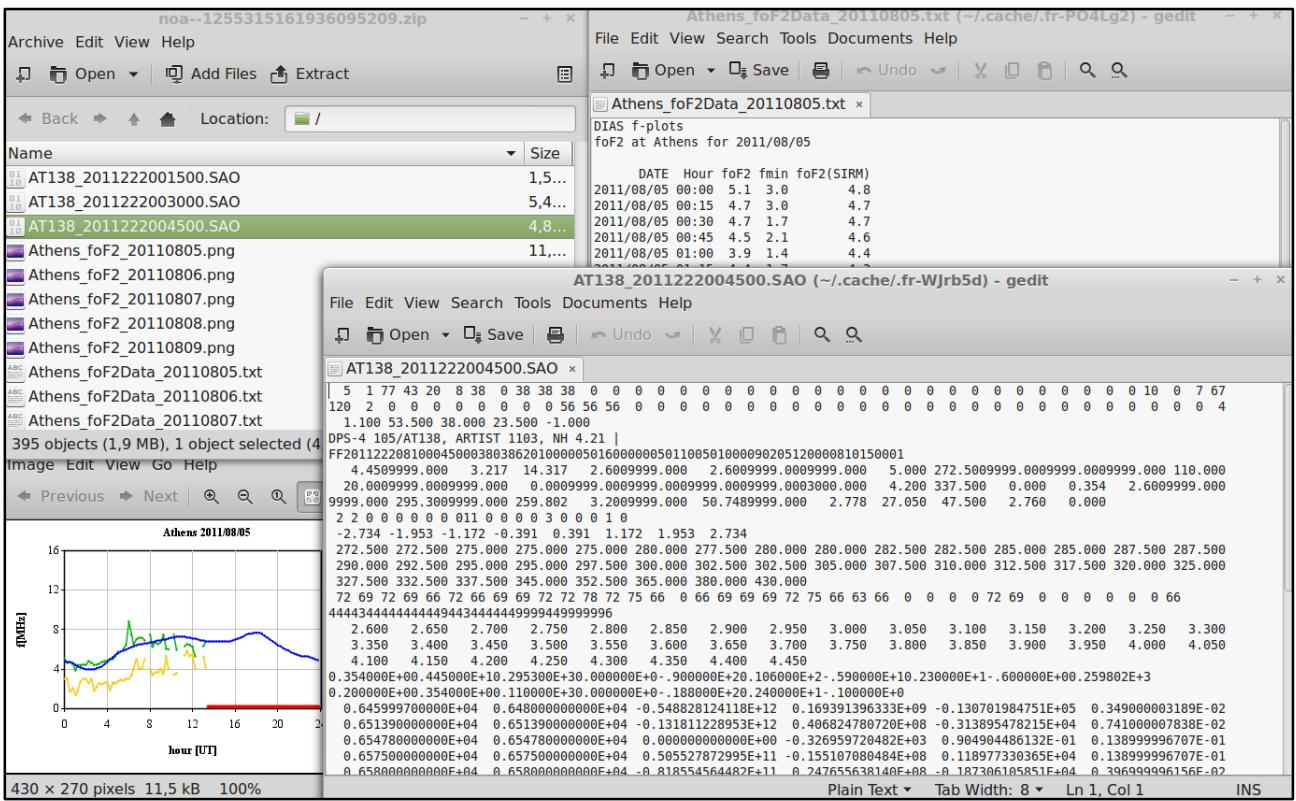
The screenshot shows the 'My Dataset File Downloads' page on the ESPAS website. At the top, there is a navigation bar with links for HOME, SEARCH, BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, SUPPORT, and MY ACCOUNT. The MY ACCOUNT link is highlighted in blue. On the left, there is a sidebar titled 'IN THIS SECTION' with links for 'My Personal Info', 'My Dataset File Downloads' (which is highlighted in dark blue), 'My Data Values Downloads', and 'My Location Searches'. The main content area displays a table of download requests. One row is expanded to show details for a request titled 'Critical Frequencies August 2011 (2015-08-21 03:31:26)'. The status is 'COMPLETED'. It includes information about the provider ('National Observatory of Athens'), expiration date ('2015-09-25 04:23:19'), and a red-bordered button with the text 'Click here to download the files from National Observatory of Athens'. To the right of the table, there are buttons for 'Refresh Status', 'Cancel Request', 'Resubmit Request', and 'View Search Results'. Below the table, there is a 'Query Options' section with fields for 'Assets' (Athens Digisonde), 'Observation Collections' (Athens Digisonde SAO files (autoscaled), DIAS daily f-plots of fmin,foF2 from Athens Digisonde), 'Observed Properties' (E-layer Critical Frequency, F1-layer Critical Frequency, F2-layer Critical Frequency), and 'Time Periods' (2011-08-05 00:00:00 - 2011-08-09 23:59:00 00:00 - 23:59 UTC).

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8. You can save the file by choosing the option “Save File” or open the zip file by choosing the option “Open with..” in your browser pop up window. Open or extract the zip file to get the actual data files. Inside the zip file there is a text file with name “DownloadRequestReport.txt” that reports information regarding the download request. The actual data files are inside the “noa” folder, where “noa” is a short name for the National Observatory of Athens (ESPAS Data Provider).



9. Open or extract the “noa” folder. The data files are included in this folder in a zip file. Extract this file and you can get the actual data files. In this example, the downloaded data files consist of SAO files, images and text files (f-plots).



4. Download of Data Values: Examples

The download of data values is a service that is available only from the “Results”/“Location Results” page after the submission of a progressive or spatial/temporal search request. This service requires registration and log in the ESPAS portal.

Below, an example of how to request and download data values from ESPAS portal is presented that is associated with the example presented in the section “2.1 Progressive Search”. The following steps apply to the “Results” page and are the same for both the progressive search “Results” and the spatial/temporal search “Location Results” page.

1. In the “Results” page click the **Data values** option from the **Download** drop down menu.

The screenshot shows the ESPAS search results page. At the top, there is a navigation bar with links for LOGIN, REGISTER, ESPAS Project, and Contact Us. Below the navigation bar, the ESPAS logo and the text "near earth space data infrastructure for e-science" are displayed. The main content area has tabs for HOME, SEARCH (which is selected), BROWSE, ESPAS POLICIES, VALUE ADDED SERVICES, and SUPPORT. Under the SEARCH tab, there is a section titled "Current Selections" with information about time periods, observed properties, assets, and observation collections. To the right of this section are four icons: Time Period, Assets, Observed Properties, and Observation Collections. Below this, there are "Back" and "Submit" buttons, and a "Start New Search" link. A "Results" section follows, containing a message to select download dataset files or data values. On the left, there is a "Refine by" sidebar with dropdown menus for Project, Observation Collection, Instrument, Region of Space, Platform, Model, Dimensionality Timeline, and Dimensionality Instance. On the right, there is a summary of observations (Number of Observations: 4) and a "Download" button with a dropdown menu. The "Dataset files" option is highlighted in blue, while "Data values" is also visible in the menu. Below the download menu, two observation items are listed: "Athens Digisonde SAO files (autoscaled)" and "DIAS daily f-plots of fmin,foF2 from Athens Digisonde".

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2. You will be prompted to log in the ESPAS portal, if you are not already logged in.



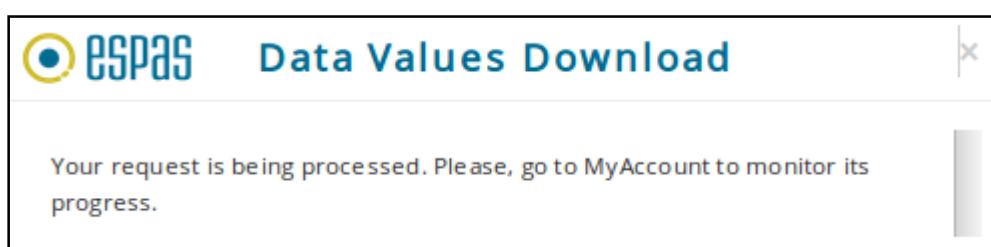
The screenshot shows a login interface for the ESPAS portal. At the top left is the ESPAS logo, which consists of a blue circle with a yellow dot inside, followed by the word "espas" in a lowercase sans-serif font. To the right of the logo is the word "Login". Below the logo is a message: "You must be a registered ESPAS user in order to download data. If you are a registered user, please proceed to login." There are two input fields: one for "ESPAS Account (E-mail Address *)" containing "annacharisi@yahoo.com" and another for "Password (*)" containing a series of eight asterisks. At the bottom is a blue "Login" button.

3. The “Data Values Download” page opens in a pop up window. You can choose the observed properties you wish to download. In this example, the F2-layer Critical Frequency is chosen by clicking on the appropriate checkbox. You may give a name to your download request. If you leave it empty, the default name will be the submission date/time of the request.

Additionally, a list of the licences of the ESPAS Data Providers that are related to the results is presented. Clicking on each licence, you can view the entire licence text. According to ESPAS Policies (see also section 1.9 ESPAS Policies), on requesting data, users are asked to agree to the data providers' licences. Therefore, you should tick the box “I agree to all the Licences” and click the **Download** button in order to submit your download request for all the results. However, if you wish to agree with some of the Data Providers' licenses, then only the data from these Data Providers will be available for download to you.

The screenshot shows the 'Data Values Download' interface. At the top, there is a logo for 'espas' and the title 'Data Values Download'. Below this, a message says 'Select which observed properties to download'. A 'Filter...' button is available. A list of properties includes 'Title', 'E-layer Critical Frequency', 'F1-layer Critical Frequency', and 'F2-layer Critical Frequency', with 'F2-layer Critical Frequency' checked. A note below the list says 'Give a name to your download request. Otherwise it will default to the request date.' A 'Request name' field contains 'foF2 values August 2011'. Under the heading 'Licences', there are two checkboxes: 'I agree to all the Licences' (unchecked) and 'I agree to the NOA's Terms of Reference licence' (checked). A 'Download' button is located at the bottom right.

4. A message is displayed informing you that your request is being processed. You should visit the **My Account → My Data Values Downloads** page to monitor its progress (see also section 1.12.3 My Data Values Downloads). You will be also informed by email upon the completion of the download request. Close this window by clicking the X in the top right corner.



5. Visit the **My Account → My Dataset File Downloads** page to monitor the progress of the download request. If you want to check its status or view more information about it, click on its name: “foF2 values August 2011” (see also section 1.12.3 My Data Values Downloads).

The screenshot shows a web page titled "foF2 values August 2011 (2015-08-21 01:53:52)" with a status of "COMPLETED". It includes sections for "Query Options" and "Selected Observed Properties".

Query Options:

- Assets:** Athens Digisonde
- Observation Collections:** Athens Digisonde SAO files (autoscaled), DIAS daily f-plots of fmin,foF2 from Athens Digisonde
- Observed Properties:** E-layer Critical Frequency, F1-layer Critical Frequency, F2-layer Critical Frequency
- Time Periods:** 2011-08-05 00:00:00 - 2011-08-09 23:59:00 00:00 - 23:59 UTC

Selected Observed Properties:

- F2-layer Critical Frequency

Buttons on the right include "Refresh Status", "Resubmit Request", and "View Search Results".

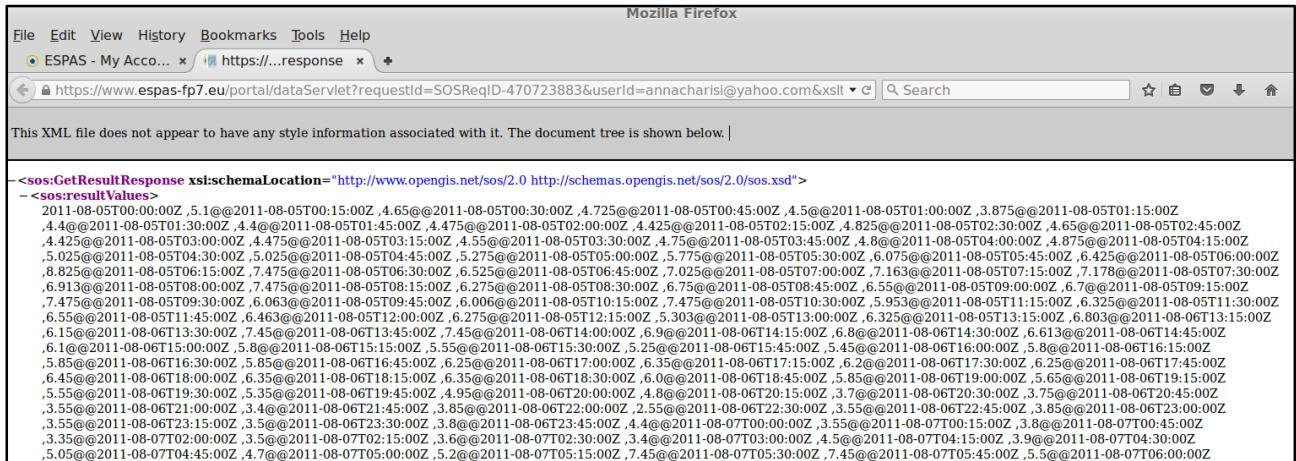
6. In order to view/download the data values in Ascii format, click the **Ascii** option of the **Get Data as** drop down menu. The data values (marked by a timestamp) are presented in a new tab/window of your browser in ascii format as comma separated values. The header line of the file is the description of the fields of the data values. So, the first value corresponds to the time stamp (in UTC) of the measured observed property, while the second value is the name of the data provider. Afterwards, the extracted data values of measured observed properties are presented in the order defined by the header line. The data values are grouped by data provider and extracted parameter. You can use the “Save Page as” of your browser to save this file locally on your computer.

The screenshot shows a Mozilla Firefox browser window with a new tab open at "https://www.espas-fp7.eu/portal/dataServlet?requestId=SOSReqID-470723883&userId=annacharisi@yahoo.com&". The content of the tab displays the ASCII data for the foF2 values:

```
%Phenomenon Time ,Provider Name ,foF2 http://ontology.espas-fp7.eu/unit/MHz (MHz);
2011-08-05T00:00:00Z ,National Observatory of Athens ,5.1;
2011-08-05T00:15:00Z ,National Observatory of Athens ,4.65;
2011-08-05T00:30:00Z ,National Observatory of Athens ,4.725;
2011-08-05T00:45:00Z ,National Observatory of Athens ,4.5;
2011-08-05T01:00:00Z ,National Observatory of Athens ,3.875;
2011-08-05T01:15:00Z ,National Observatory of Athens ,4.4;
2011-08-05T01:30:00Z ,National Observatory of Athens ,4.4;
2011-08-05T01:45:00Z ,National Observatory of Athens ,4.475;
2011-08-05T02:00:00Z ,National Observatory of Athens ,4.425;
2011-08-05T02:15:00Z ,National Observatory of Athens ,4.825;
2011-08-05T02:30:00Z ,National Observatory of Athens ,4.65;
2011-08-05T02:45:00Z ,National Observatory of Athens ,4.425;
2011-08-05T03:00:00Z ,National Observatory of Athens ,4.475;
2011-08-05T03:15:00Z ,National Observatory of Athens ,4.55;
2011-08-05T03:30:00Z ,National Observatory of Athens ,4.75;
2011-08-05T03:45:00Z ,National Observatory of Athens ,4.8;
2011-08-05T04:00:00Z ,National Observatory of Athens ,4.875;
2011-08-05T04:15:00Z ,National Observatory of Athens ,5.025;
2011-08-05T04:30:00Z ,National Observatory of Athens ,5.025;
2011-08-05T04:45:00Z ,National Observatory of Athens ,5.275;
2011-08-05T05:00:00Z ,National Observatory of Athens ,5.775;
2011-08-05T05:30:00Z ,National Observatory of Athens ,6.075;
2011-08-05T05:45:00Z ,National Observatory of Athens ,6.425;
2011-08-05T06:00:00Z ,National Observatory of Athens ,8.625;
2011-08-05T06:15:00Z ,National Observatory of Athens ,7.475;
2011-08-05T06:30:00Z ,National Observatory of Athens ,6.525;
```

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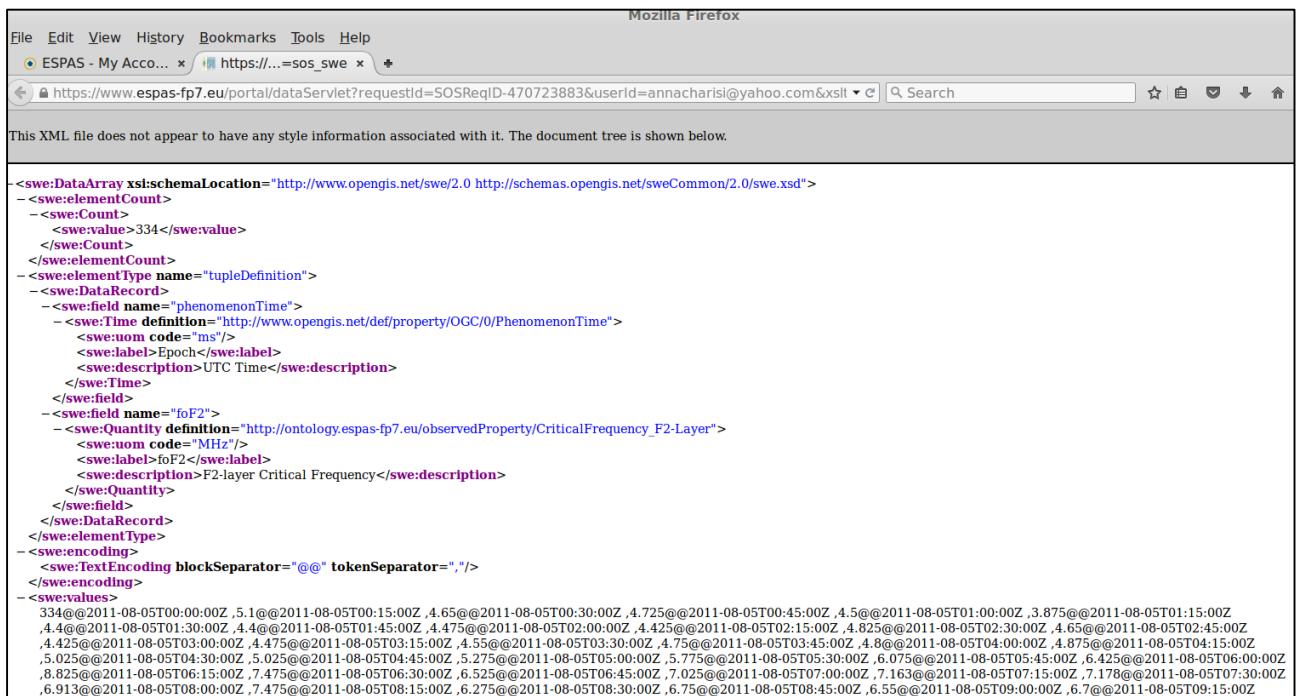
7. Regarding the XML format of the data values, there are two options available: the SOS – Result and the SOS – SWE format. In order to view/download the data values in the SOS – Result format, click the **SOS-Result (XML)** option of the **Get Data as** drop down menu. The data values are presented in a new tab/window of your browser in the XML format that corresponds to the SOS response. You can use the “Save Page as” of your browser to save this file locally on your computer.



This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<sos:GetResultResponse xsi:schemaLocation="http://www.opengis.net/sos/2.0 http://schemas.opengis.net/sos/2.0/sos.xsd">
- <sos:resultValues>
  2011-08-05T00:00:00Z ,5.1@2011-08-05T00:15:00Z ,4.65@2011-08-05T00:30:00Z ,4.725@2011-08-05T00:45:00Z ,4.5@2011-08-05T01:00:00Z ,3.875@2011-08-05T01:15:00Z
  ,4.4@2011-08-05T01:30:00Z ,4.4@2011-08-05T01:45:00Z ,4.475@2011-08-05T02:00:00Z ,4.425@2011-08-05T02:15:00Z ,4.825@2011-08-05T02:30:00Z ,4.65@2011-08-05T02:45:00Z
  ,4.425@2011-08-05T03:00:00Z ,4.475@2011-08-05T03:30:00Z ,4.55@2011-08-05T03:45:00Z ,4.4@2011-08-05T04:00:00Z ,4.875@2011-08-05T04:15:00Z
  ,5.025@2011-08-05T04:30:00Z ,5.025@2011-08-05T04:45:00Z ,5.275@2011-08-05T05:00:00Z ,5.775@2011-08-05T05:30:00Z ,6.075@2011-08-05T06:00:00Z
  ,8.825@2011-08-05T06:15:00Z ,6.525@2011-08-05T06:45:00Z ,7.025@2011-08-05T07:00:00Z ,7.178@2011-08-05T07:30:00Z
  ,6.913@2011-08-05T08:00:00Z ,7.475@2011-08-05T08:15:00Z ,6.275@2011-08-05T08:30:00Z ,6.75@2011-08-05T08:45:00Z ,6.55@2011-08-05T09:00:00Z ,6.7@2011-08-05T09:15:00Z
  ,7.475@2011-08-05T09:30:00Z ,6.063@2011-08-05T09:45:00Z ,6.006@2011-08-05T10:15:00Z ,6.745@2011-08-05T10:30:00Z ,5.953@2011-08-05T11:15:00Z ,6.325@2011-08-05T11:30:00Z
  ,6.55@2011-08-05T11:45:00Z ,6.463@2011-08-05T12:00:00Z ,6.275@2011-08-05T12:15:00Z ,5.303@2011-08-05T13:00:00Z ,6.325@2011-08-05T13:15:00Z
  ,6.15@2011-08-06T13:30:00Z ,7.45@2011-08-06T13:45:00Z ,7.45@2011-08-06T14:00:00Z ,6.9@2011-08-06T14:15:00Z ,6.8@2011-08-06T14:30:00Z ,6.613@2011-08-06T14:45:00Z
  ,6.1@2011-08-06T15:00:00Z ,5.8@2011-08-06T15:15:00Z ,5.55@2011-08-06T15:30:00Z ,5.25@2011-08-06T15:45:00Z ,5.45@2011-08-06T16:00:00Z ,5.8@2011-08-06T16:15:00Z
  ,5.85@2011-08-06T16:30:00Z ,5.85@2011-08-06T16:45:00Z ,6.25@2011-08-06T17:00:00Z ,6.35@2011-08-06T17:15:00Z ,6.2@2011-08-06T17:30:00Z ,6.25@2011-08-06T17:45:00Z
  ,6.45@2011-08-06T18:00:00Z ,6.35@2011-08-06T18:15:00Z ,6.35@2011-08-06T18:30:00Z ,6.0@2011-08-06T18:45:00Z ,5.85@2011-08-06T19:00:00Z ,5.65@2011-08-06T19:15:00Z
  ,5.55@2011-08-06T19:30:00Z ,5.35@2011-08-06T19:45:00Z ,4.95@2011-08-06T20:00:00Z ,4.8@2011-08-06T20:15:00Z ,3.7@2011-08-06T20:30:00Z ,3.75@2011-08-06T20:45:00Z
  ,3.55@2011-08-06T21:00:00Z ,3.4@2011-08-06T21:45:00Z ,3.85@2011-08-06T22:00:00Z ,2.55@2011-08-06T22:30:00Z ,3.55@2011-08-06T22:45:00Z ,3.85@2011-08-06T23:00:00Z
  ,3.55@2011-08-06T23:15:00Z ,3.5@2011-08-06T23:30:00Z ,3.8@2011-08-06T23:45:00Z ,4.4@2011-08-07T00:00:00Z ,3.55@2011-08-07T00:15:00Z ,3.8@2011-08-07T00:45:00Z
  ,3.35@2011-08-07T02:00:00Z ,3.2@2011-08-07T02:15:00Z ,3.6@2011-08-07T02:30:00Z ,3.4@2011-08-07T03:00:00Z ,4.5@2011-08-07T04:15:00Z ,3.9@2011-08-07T04:30:00Z
  ,5.05@2011-08-07T04:45:00Z ,4.7@2011-08-07T05:00:00Z ,5.2@2011-08-07T05:15:00Z ,7.45@2011-08-07T05:30:00Z ,7.45@2011-08-07T05:45:00Z ,5.5@2011-08-07T06:00:00Z
```

8. In order to view/download the data values in the SOS – SWE format, click the **SOS-SWE (XML)** option of the **Get Data as** drop down menu. The data values are presented in a new tab/window of your browser in the XML format that corresponds to the SOS response in SWE format. You can use the “Save Page as” of your browser to save this file locally on your computer.

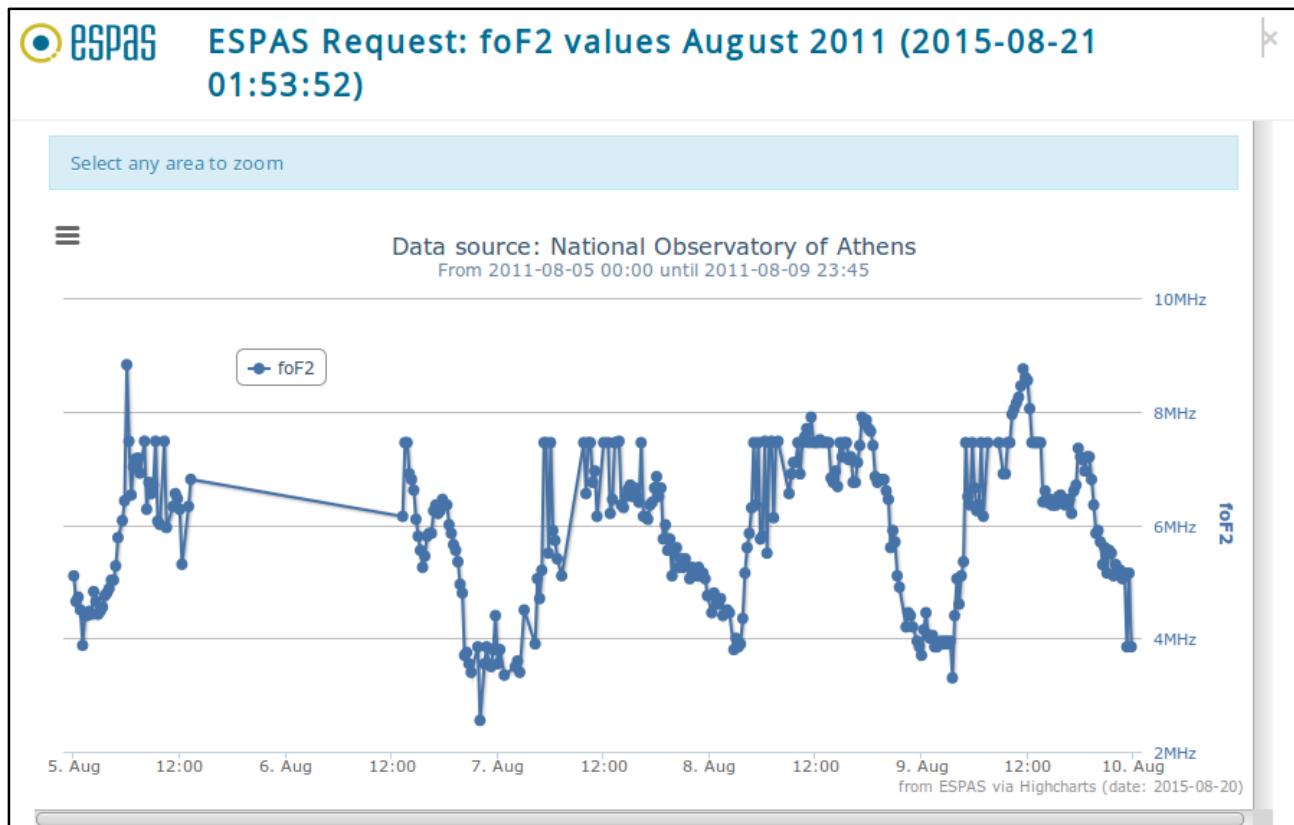


This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<swe:DataArray xsi:schemaLocation="http://www.opengis.net/swe/2.0 http://schemas.opengis.net/sweCommon/2.0/swe.xsd">
- <swe:elementCount>
  - <swe:Count>
    <swe:value>334</swe:value>
  </swe:Count>
</swe:elementCount>
- <swe:elementType name="tupleDefinition">
- <swe:DataRecord>
  - <swe:field name="phenomenonTime">
    - <swe:Time definition="http://www.opengis.net/def/property/OGC/0/PhenomenonTime">
      <swe uom code="ms"/>
      <swe:label>Epoch</swe:label>
      <swe:description>UTC Time</swe:description>
    </swe:Time>
  </swe:field>
  - <swe:field name="foF2">
    - <swe:Quantity definition="http://ontology.espas-fp7.eu/observedProperty/CriticalFrequency_F2-Layer">
      <swe uom code="MHz"/>
      <swe:label>foF2</swe:label>
      <swe:description>F2-layer Critical Frequency</swe:description>
    </swe:Quantity>
  </swe:field>
</swe:DataRecord>
</swe:elementType>
- <swe:encoding>
  <swe:TextEncoding blockSeparator="@@" tokenSeparator="."/>
</swe:encoding>
- <swe:values>
  334@2011-08-05T00:00:00Z ,5.1@2011-08-05T00:15:00Z ,4.65@2011-08-05T00:30:00Z ,4.725@2011-08-05T00:45:00Z ,4.5@2011-08-05T01:00:00Z ,3.875@2011-08-05T01:15:00Z
  ,4.4@2011-08-05T01:30:00Z ,4.4@2011-08-05T01:45:00Z ,4.475@2011-08-05T02:00:00Z ,4.425@2011-08-05T02:15:00Z ,4.825@2011-08-05T02:30:00Z ,4.65@2011-08-05T02:45:00Z
  ,4.425@2011-08-05T03:00:00Z ,4.475@2011-08-05T03:30:00Z ,4.55@2011-08-05T03:45:00Z ,4.4@2011-08-05T04:00:00Z ,4.875@2011-08-05T04:15:00Z
  ,5.025@2011-08-05T04:30:00Z ,5.025@2011-08-05T04:45:00Z ,5.275@2011-08-05T05:00:00Z ,5.775@2011-08-05T05:30:00Z ,6.075@2011-08-05T05:45:00Z ,6.425@2011-08-05T06:00:00Z
  ,8.825@2011-08-05T06:15:00Z ,7.475@2011-08-05T06:30:00Z ,6.525@2011-08-05T06:45:00Z ,7.025@2011-08-05T07:00:00Z ,7.163@2011-08-05T07:15:00Z ,7.178@2011-08-05T07:30:00Z
  ,6.913@2011-08-05T08:00:00Z ,7.475@2011-08-05T08:15:00Z ,6.275@2011-08-05T08:30:00Z ,6.75@2011-08-05T08:45:00Z ,6.55@2011-08-05T09:00:00Z ,6.7@2011-08-05T09:15:00Z
```

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9. In order to view a plot of the data values, click the **Linear plot** option of the **Get Plot Data as** drop down menu. The plot of the downloaded data values open in a new pop up window. You can select any area to zoom.



10. You can save the plot locally on your computer by clicking the button at the top left corner and then selecting the preferable format.

